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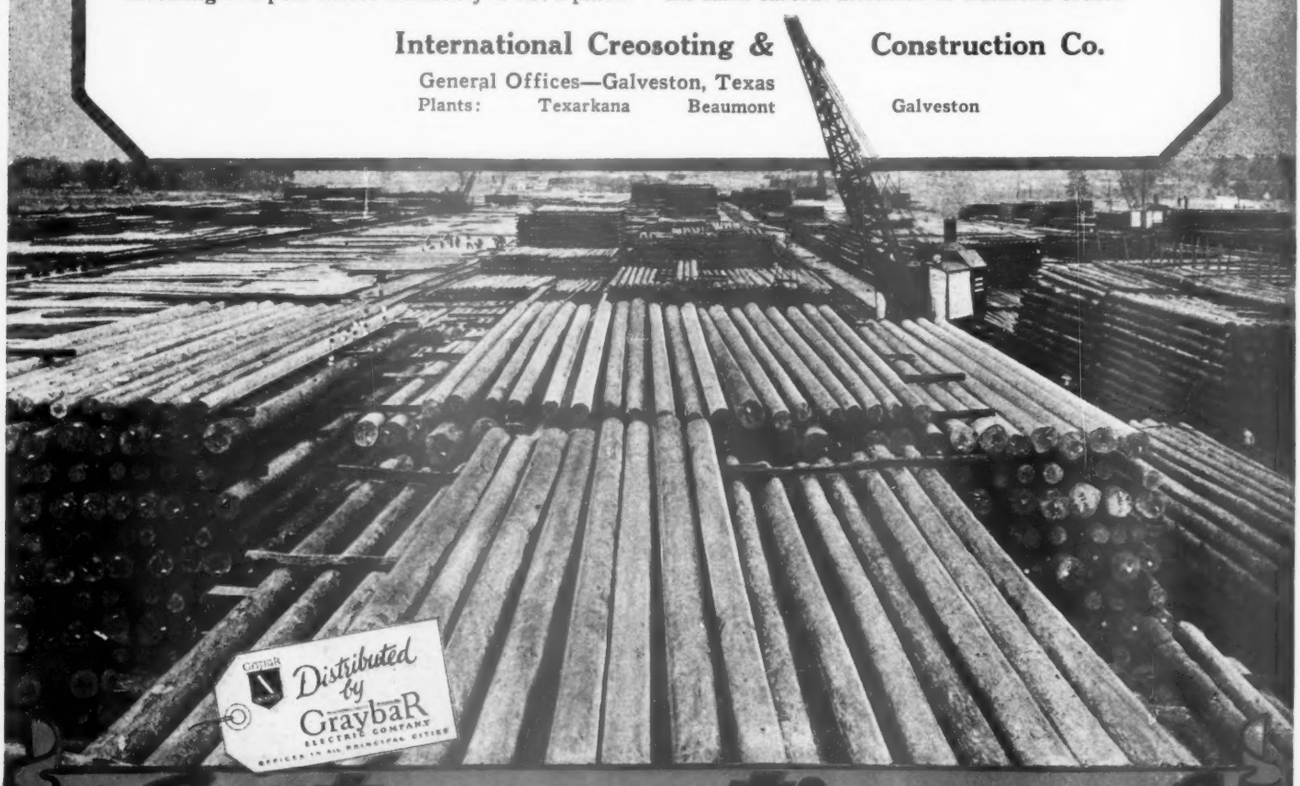

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The Oil and Gas Journal

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Oklahoma Gain Offsets California Drop

Highest daily average estimated total production in 1928, week ended Dec. 29, 2,585,844 bbls. Lowest in 1928, May 19, 2,338,241 bbls.

Lower Production Expected for This Week. Industry More Optimistic Regarding Success of Conservation Plan

By Andrew M. Rowley

Highest daily average estimated light oil production in 1928, week ended Dec. 29, 2,158,134 bbls. Lowest in 1928, Mar. 3, 1,927,713 bbls.

A substantial decrease in production in California, averaging nearly 20,000 barrels daily, was not sufficient to overcome the increase resulting in Oklahoma from the opening of wells in the Greater Seminole area to obtain figures of potential production for proration purposes, the output for the United States as a whole registering an increase during the past week. Production in Oklahoma during this week will be less than last and, from present indications, this decline may average at least 15,000 barrels daily for the week as compared to last week's figures. Consequently, it seems probable now production for the country as a whole will register a decline during this week.

More optimism seems to pervade the industry in regard to the probable success of the movement of the American Petroleum Institute to hold production of the country as a whole more nearly to market requirements with the output during 1928 set as the limit of what crude is needed. When the situation is analyzed and it is understood the plan contemplates reducing production during the remainder of this year not to the average for the whole of 1928 but only to the average for the last nine months of 1928, the task does not seem nearly as big as at first thought. In other words, the excess production on April 1 of this year, as compared to the average for the last nine months of 1928, will total probably around 160,000 barrels daily. If the operators in the Greater Seminole area in Oklahoma alone have been able to reduce production of that section by 120,000 barrels daily, as is shown by production of wells in the area when opened to obtain gauges of potential output, a reduction of 160,000 barrels daily for the country as a whole for the remainder of the year should not be considered as an impossible task.

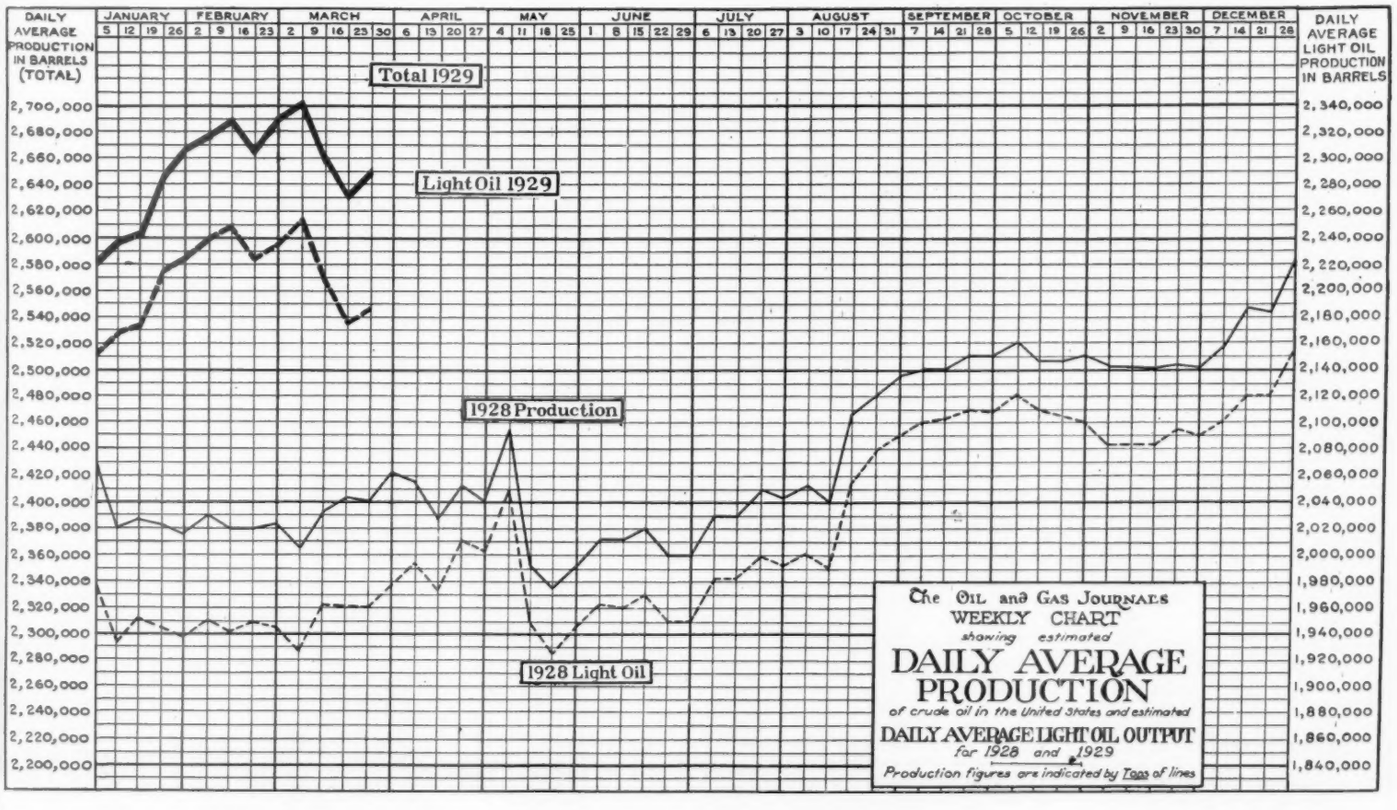
While the present conservation movement should result in a substantial improvement in the crude oil situation it must be kept in mind the vast quantities of crude and other oils in storage represent a big burden on the industry and no real prosperity can be experienced until big drafts are made on this storage. The government report, to be issued next week, undoubtedly will show further large additions to storage.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended March 23, and a comparison with the previous week follows:

	Mar. 23		Mar. 16	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	10,045	.....	10,015	.....
Burbank	22,320	.....	22,470	.....
Other Osage Fields	25,370	.....	25,395	.....
St. Louis-Pearson	102,295	.....	95,430	.....
Cushing and Shamrock	20,790	.....	20,770	.....
Bristow	19,285	.....	19,360	.....
Allen	26,290	.....	26,685	.....
Seminole	284,740	.....	263,970	.....
Northern Miscellaneous	111,605	.....	111,065	.....
Southern Fields	54,520	.....	54,395	.....
Total Oklahoma	677,260	.....	649,555	.....
West Texas—				
Hendricks	168,421	.....	166,592	.....
Yates	86,659	.....	86,892	.....
Remainder	127,520	.....	132,640	.....
Total West Texas	382,600	.....	385,640	.....
North Louisiana	29,865	5,960	30,030	6,010
Arkansas	24,830	49,875	24,650	49,870
North Central Texas	135,936	.....	135,827	.....
Texas Panhandle	57,845	.....	55,950	.....
East Central Texas	21,944	.....	21,892	.....
Kansas	94,810	.....	96,320	.....
Total Mid-Continent Area	1,425,090	55,835	1,399,864	55,880
Gulf Coast	.....	150,519	.....	148,981
Southwest Texas	.....	65,932	.....	61,731
Eastern	109,500	.....	109,000	.....
Rocky Mountain Area	73,315	.....	65,563	.....
California—				
Santa Fe Springs	155,000	.....	177,000	.....
Long Beach	185,000	.....	184,000	.....
Torrance	2,000	12,750	2,000	12,750
Huntington Beach	45,500	.....	46,000	.....
Elwood	28,500	.....	27,000	.....
Inglewood	14,500	11,000	14,750	11,000
Ventura Avenue	55,500	.....	56,000	.....
Seal Beach	37,000	.....	37,000	.....
Remainder of State	58,000	166,000	57,000	166,000
Total California	581,000	189,750	600,750	189,750
Total United States	2,188,905	462,036	2,175,177	456,342
Grand Total	2,650,941		2,631,519	

Total Increase, 19,422 Bbls.; Light Oil Increase, 13,728 Bbls.



Prices on U.S. Motor Gasoline Advance

Larger Refiners Increase Price One-Eighth Cent. Kerosene and Natural Gasoline Also Higher. Other Products Steady

By C. O. Willson

An advance in the U. S. motor grade of refinery gasoline, substantially higher prices for natural gasolines and kerosene and a steady market in the remaining products summarized the Oklahoma (Group 3) market situation the first of the week.

Most of the larger refiners in the state advanced their price on U. S. motor gasoline to the jobber trade from 7 to 7⅛ cents the latter part of last week. Following heavy domestic buying with an export purchase in North Texas, the Standard Oil company of Indiana advanced kerosene tank wagon prices 1 cent on Thursday and this was quickly reflected in the Oklahoma refinery market where 6½ cents was the prevailing quotation for the 41-43 water white grade the first of the week.

Continued heavy buying of natural gasolines last week practically absorbed all the material available for shipment over the remainder of March and on Friday and Saturday there was a sharp advance in prices. On Monday and Tuesday the going market on the A and AA grades was 8 cents, B and BB 7 cents, and Grade C 6¾ cents. In the remaining products fuel oil and gas oil prices were firm with only minor changes in furnace oil distillates although the demand is slumping rapidly.

Refinery Gasolines

The advance in the U. S. motor grade of refinery gasoline reflects the more optimistic attitude now apparent in oil circles generally regarding the outlook over the next few months at least. The gasoline market quickly reflects any changes, tentative or otherwise, which point to improvement in basic conditions.

Refiners are keeping in touch with the efforts being made under the sponsorship of the American Petroleum Institute to bring about an equilibrium between crude oil supply and demand with a nation wide curtailment including South America and Mexico. Should this program be carried out the refiners feel that the overproduction threat both in crude oil and gasoline will be removed with higher prices assured.

In addition to this general improvement which is largely anticipatory at this time there is a local situation in Oklahoma which will bear watching the remainder of the year regardless of developments in other sections. Although the industry as a whole has had surplus crude oil production over the past three months there has never been a time when large surpluses were available in Oklahoma and certain other sections of the Mid-Continent where high gravity crudes are available.

The fact that Oklahoma crude oil production has been reduced approximately 75,000 bbls. daily during the past month has tightened this crude oil situation. There are a number of refiners within the state who desire additional crude oil supplies and most of the major buyers who serve outside refineries through pipe line connections also are soliciting additional supplies. In brief, the high gravity crude situation is termed "tight" and those in close touch with conditions do not expect this condition to change over the next few months at least. This situation is reflected in the spot gasoline market in that the refiners are refusing price concessions even in cases where considerable gasoline is being run to storage. In this connection the recent purchase of the T. B. Slick properties by the Prairie Oil & Gas Co. is expected to divert some of the crude now available to independent refiners in the State to a major pipe line system serving major refineries in other states.

High Gravity Gasolines

Up to Tuesday the advance in refinery gasolines had been largely confined to the U. S. motor grade. Higher gravities may be advanced before the end of the week although there are a few refiners

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REFINED MARKET BAROMETER

The refinery gasoline market was steady or advancing in most of the refining areas, the only price decline in the domestic grades materializing on the East Coast. Following improvement in the retail gasoline market on the West Coast, California refinery gasoline prices, including natural gasolines, recovered sharply with no change in prices for export and coastwise movement. Kerosenes presented a somewhat mixed situation. Prices were advanced in the Mid-Continent and Middle West, with higher export prices at the coast. The movement was slow in the eastern states, however, and several companies on the East Coast reduced their prices. No price changes were reported either in fuel oils or gas oils. The movement of these products was steady. Natural gasolines again advanced in the Mid-Continent, reaching the highest level for this year. Steam refined cylinder stocks and bright stocks were in strong demand in Pennsylvania and the coastal market, and prices were higher on most grades. Little activity was reported in wax, either in the domestic or export market.

Mid-Continent—Kerosene advanced in Oklahoma, Kansas and North Texas. Domestic grades of refinery gasolines also higher in these areas. Natural gasolines continue to advance and reached highest level since December of last year. Fuel oil and gas oil steady. Good demand for bright stocks and better grades of steam refined cylinder stocks. No change in wax.

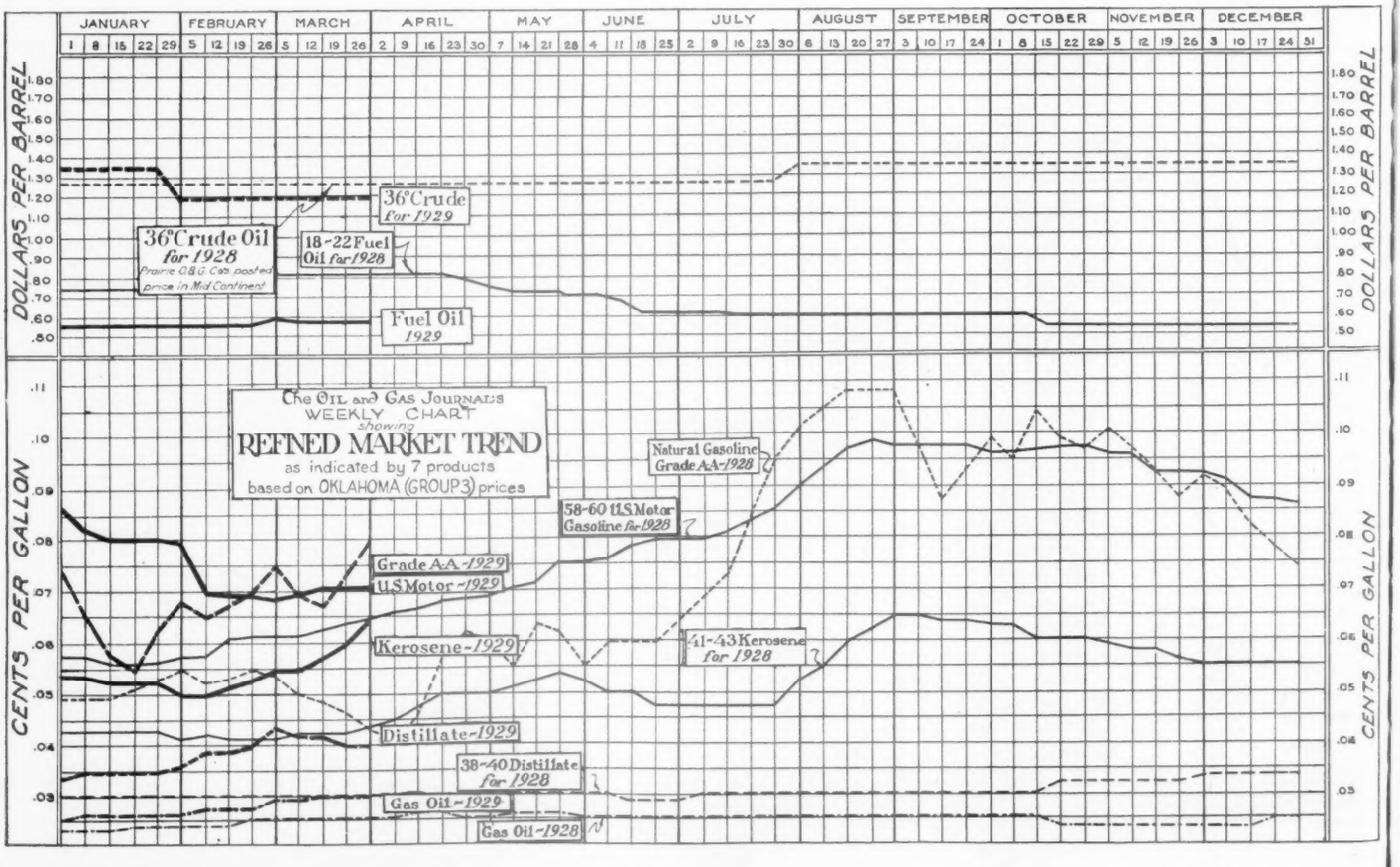
East Coast—Prices on U. S. Motor gasoline for domestic movement lower. This market expected to improve as consumption is increasing. Kerosene domestic market lower despite an advance in export prices. Steam refined cylinder stocks and bright stocks strong and prices higher. Fuel oil and gas oil prices unchanged. Better movement of petrolatum for export. Wax market irregular.

Pennsylvania—Steam refined and bright stock prices higher. Better movement of gasoline and prices steady. Kerosene strong. No change in fuel oils. Wax unchanged.

California—Refinery gasoline and natural gasoline prices advanced for domestic shipment following advance in tank wagon and service station prices. Prices higher on kerosene and some grades of engine distillate.

Chicago—Kerosene prices higher following advance in tank wagon prices throughout Middle West. Gasoline demand improves and prices higher. Furnace oil demand light. Many inquiries for fuel oil.

Gulf Coast—Fuel oils steady. Good demand for lubricating oils, especially heavier oils.



Endorsement of Curtailment Assured

World Petroleum Problems Discussed By Institute Directors. Sir Henri Deterding Extending Cooperation

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Mar. 26.—The board of directors of the American Petroleum Institute in special session here tomorrow will endorse the curtailment resolution adopted by the general committee of the American Petroleum Institute on World Production and Consumption of Petroleum and Its Products at its meeting in Houston recently. This action was assured following informal conferences held today by leading oil company executives from various sections of the United States and after thorough discussions of the overproduction situation and other world petroleum problems. Statement was made that endorsement would be given tomorrow to the suggested steps looking towards curtailment of crude oil output in the United States and northern South America.

Sir Henri Deterding, managing director of the Royal Dutch-Shell interests, is here for the meeting. It is understood he will extend the American oil industry assurances of co-operation in limiting crude production in other parts of the world as well.

The curtailment resolution will be submitted to the Federal Oil Conservation Board for its approval, and authorities in the leading oil producing States will also be advised of the Institute's action, after the meeting tomorrow.

Under the curtailment plan, to become effective April 1, domestic production and output in the United States and northern South America will be held down to a par with the output of these areas during 1928. In other words, aggregate production in this country and in northern South America for the nine months beginning April 1 is not to exceed that for the comparable months last year. Production at the rate maintained during the closing three-quarters of 1928 is considered by leaders in the industry as adequate for the needs of principal consuming countries not only for the current year, but for several years to come as well.

Will Appoint Committees

A number of committees to work out the recommendations embodied in the conservation resolution will be appointed, and it is expected that definite action looking toward some correction of the production situation in Venezuela will also be worked out.

Sir Henri Deterding is attending the meeting to discuss problems of world co-operation with leaders of the American industry, and has already informally taken up the discussion of future operations in northern South America, where Royal Dutch is a leader through its heavy production in Venezuela.

Co-operation of the various regional committees is being enlisted in effecting a solution of the problem of curtailment activity in each individual territory. As a result of the regional meetings held since the Houston conference, however, much of this preliminary work has already been taken care of and no time will be lost in announcing definite allotments for each region.

It is understood the meeting tomorrow will also endorse the suggestion made at Houston that the industry, through the American Petroleum Institute, establish a permanent organization to foster the conservation movement, and E. B. Reeser, president of the Institute, expects shortly to announce the personnel of such a group. This permanent organization will handle not only problems pertaining to crude oil production, but will likewise go into distributive problems on a world-wide scope.

Deny Rumors of "Czar"

Numerous reports that the oil industry of the United States would appoint someone to oversee the industry, much along the lines of plans in force in the motion picture industry and in organized baseball, were denied by President Reeser. He denied specifically reports that Former President Coolidge and General Pershing have been approached with offers to assume such a post in the oil industry. The American Petroleum Institute, Mr. Reeser declared, has no such plan in mind at the moment.

Considerable talk regarding the possibility of the establishment of a more harmonious relationship in world marketing of petroleum products has been heard in connection with the special meeting of the Petroleum Institute directors here. The presence of Sir Henri Deterding is regarded as indicative of the launching of negotiations for something in the nature of a world-wide accord on marketing problems, and it is expected that something definite along this line will be worked out during Sir Henri's visit to this country.

Aside from Sir Henri Deterding's importance as spokesman for the Royal Dutch-Shell group, particular significance is attached to his visit at this time as it is understood he will speak for Sir John Cadman, head of the Anglo-Persian Oil Co., and thus, indirectly, for the British government, which holds a controlling interest in Anglo-Persian.

An official of the Hoover administration, it is understood, will be at the gathering as representative of the Government, which has taken a leading part in efforts being made to stabilize the American petroleum industry. The attitude of President Hoover, and of the Federal Oil Conservation Board, will be of the utmost importance in the efforts of the industry to straighten out the vital problems created by current overproduction of crude oil.

Venezuelan Curtailment

The problem of overproduction in domestic fields is believed to be close to solution, following the comprehensive program laid down during the Houston meeting, and the Federal ban on wildcatting in the public domain through the restriction of government leases. Chief interest is now centering on co-operation of South American operators in stemming the flood of Venezuelan crude, as well as similar action in Asia on the part of the leading British interests. The presence of Sir Henri Deterding at the meeting, it is expected, will assure favorable action in Venezuela and Asia as well, as the head of the Royal Dutch-Shell combine has at several times in the past expressed his willingness to co-operate with American producers in any comprehensive program to stabilize the world oil position. Royal Dutch-Shell, through subsidiary companies operating in Mexico and Venezuela, is a leading factor in those areas, and it is expected that Sir Henri will be in position to aid in working out a definite program for bringing the Venezuelan situation under closer control.

This week's gathering of world oil leaders is another step in what is now regarded as an ably-conceived plan to bring about world co-operation in regulating the production and distribution of petroleum and products.

Up to about a year ago, the world oil situation was considerably complicated by the long-standing feud between Royal Dutch-Shell and several British companies, on the one hand, and the Soviet oil trust on the other. The Soviet petroleum trust had been assuming a more important place in the oil industry through its exploitation of Russian oil resources. Most of these resources, including refineries, pipe lines and terminals, had been "nationalized" by the Soviet government following their seizure, without compensation, from foreign owners. Royal Dutch-Shell was a heavy loser by this "nationalization." Royal Dutch-Shell, with the moral support of the New Jersey company, had been stubbornly combating every step by the Russian oil trust in entering world oil markets. With the final ironing out of differences, world oil harmony will exist to a degree not approached in recent years. Settlement of the fight between Russian oil interests and the leading British companies in marketing gasoline in Great Britain, recently effected, was a big step in this direction.

Foreign Marketing

Another result of Sir Henry Deterding's visit at this time, it is felt by many, will be the conclusion of a working agreement between the new petroleum export association and the Royal Dutch-Shell and Anglo-Persian groups. These latter two groups have recently united in foreign marketing operations along lines similar to those contemplated for the American Export Association, and a working agreement between the two groups is naturally in order. It is reported that such an understanding has been contemplated for some time, but that its consummation had been held back pending settlement of the fight with the Soviet naphtha trust in its operations in Great Britain.

Much of the important preliminary work leading up to the present status of the world oil industry, which is generally believed to be at the threshhold of a new era, must be credited to Walter C. Teagle, president of the Standard Oil Co. (New Jersey.) Mr. Teagle, by his series of conferences with Sir Henri Deterding, Sir John Cadman and other leading British petroleum executives, laid the groundwork for the establishment of harmonious relations in world petroleum operations, and is also given credit for having been an important factor in stopping the destructive competition between Royal Dutch-Shell and certain American companies.

E. B. Reeser, president of the Barns-

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INSTITUTE'S CONSERVATION PLAN COVERS NINE MONTHS' PRODUCTION

By Andrew M. Rowley

The conservation plan of the American Petroleum Institute does not contemplate holding crude oil production in the United States and Venezuela during the whole of 1929 down to the output for the 12 months of 1928. The purpose is to keep production from April 1 of this year until the end of this year down to the output of the last nine months of 1928.

Consequently, total production in the United States during 1929 can exceed that of 1928 by a substantial quantity and still be kept within the figure set by the industry as the limit for this year. Then, during 1930, production for that whole year would be held to the figure for the whole of 1928, which means an effort will be made to keep production next year at a lower total figure than for this year.

The daily average crude oil production of the United States during the last nine months of 1928 was 2,471,954 bbls., or 178,987 bbls. a day less than the daily average for last week. From present indications there will be a decline in crude oil production during this week, hence production on April 1 of this year probably will be only approximately 160,000 bbls. daily above the daily average for the last nine months of 1928. If such be the case, that figure represents the reduction which must be made to achieve success for the institute's conservation plan.

The accompanying table shows the daily average production of the different areas during the last nine months of 1928 and the daily average for last week, together with the difference. Only four areas are producing more now than they averaged from April 1 to December 31, 1928. Their total daily average is 232,994 bbls. greater than their daily average for the last nine months of 1928. As total production in the United States is only 178,987 bbls. daily greater than the average for the last nine months of 1928, a reduction of 75 per cent in the excess of the four areas would bring the average down to the figure for the last nine months of 1928.

Area—	Average daily production last 9 months 1928	Average daily production week ending March 23, 1929	Difference
Oklahoma	680,238	677,260	— 2,978
California	639,264	770,750	+131,486
West Texas	335,979	382,600	+ 46,621
Gulf Coast	133,090	150,519	+ 17,429
Southwest Texas	28,474	65,932	+ 37,458
Kansas	103,173	94,810	— 8,363
North Texas	141,914	135,936	— 5,978
East Texas	23,236	21,944	— 1,292
North Louisiana	41,148	35,825	— 5,323
Arkansas	87,587	74,705	— 12,882
Rocky Mountain	80,210	73,315	— 6,895
Eastern	112,960	109,500	— 3,460
Texas Panhandle	64,681	57,845	— 6,836
Total	2,471,954	2,650,941	+178,987

Record Attendance, A.A.P.G. Meeting

John Y. Snyder of Shreveport Elected President at Fort Worth Session. Extensive Research Campaign Planned

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Mar. 23.—Reaching a new peak in attendance the fourteenth annual meeting of the American Association of Petroleum Geologists closed its three-day meeting in Fort Worth today with the election of John Y. Snyder, Shreveport, La., president for the ensuing year.

F. H. Kay, New York, Pan American Petroleum and Transport Co., was elected first vice president. A. Roger Denison, Fort Worth, Amerada Petroleum Corp., was chosen second vice president in charge of finances and Frederic H. Lahee, Dallas, Sun Oil Co., was named third vice president in charge of editorial work.

The Society of Economic Paleontologists and Mineralogists held its third annual meeting at the same time and Marcus A. Hanna, Houston, Gulf Production Co., was selected president. John B. Reeside, Washington, D. C., U. S. Geological Survey, was named vice president. F. B. Plummer, Bureau of Economic Geology, Austin, Tex., was re-elected secretary-treasurer and Joseph A. Cushman, Sharon, Mass., was re-elected editor of the society's publication, The Journal of Paleontology.

A close race between the candidates was indicated at the opening of the annual meeting, when three candidates were definitely in the field and rumors afloat that at least one other would be nominated for the president's chair. Although 800 members were registered only 466 voted and Mr. Snyder won by 22 votes.

Frederic H. Lahee

Election of Mr. Snyder marks the first time a Louisiana member has held office in the organization. Incidentally the Louisiana delegation made virtually a clean sweep of competitive honors. A. F. (Doc) Crider, Shreveport, won the Wallace Bostick trophy for association members with a 93 for first handicap honors. New Orleans appears to have the edge on other cities competing for the next convention.

Shortly before the nomination speeches were made T. S. Harrison's Denver friends withdrew his name and left the race to Frank W. De Wolf, Houston, and Mr. Snyder. George R. Stevens, Shreveport, Simms Oil Co., made the nominating speech for Mr. Snyder and Max W. Ball, Tulsa, nominated Mr. De Wolf. The others nominated for the vice presidents and in order follow: E. F. Schramm, Lincoln, Neb.; W. R. Hamilton, Tulsa, Okla., and C. W. Tomlinson, Ardmore, Okla.

A new mark in attendance was made when 1,541 registered and the most conservative officials estimated that at least 700 others did not register. More than 800 active members registered. Some estimated that 2,500 attended the convention, including exhibitors, supply men, etc.

Every available exhibit booth was filled to make the display the best in convention history. The entertainment program outlined by the Fort Worth society likewise scored when the Coliseum was packed with visitors, many of whom witnessed a rodeo for the first time.

Research Campaign

An extensive research campaign is being mapped and during the business session the members voted to give their financial aid to the plan. Alex. W. McCoy, Ponca City, Okla., is chairman of the committee that will carry on fundamental research work. This committee's work will not conflict with the research committee of the American Petroleum Institute but will assist.

The committee will probably make buried hills and unconformities its first study. Studies will be made of all papers published on the problems being analyzed and three meetings will be held annually. The expense of the research projects are to be borne entirely by the membership.

As an example of the wide scope of co-operative work being done Dr. F. B. Plummer reported on the progress of investigations on Permo Carboniferous stratigraphy. Dr. C. N. Gould originated the plan which has been adopted by the paleontologists and the association. It is a co-operative movement to gain more knowledge of the stratigraphy and geology of the Permian and Pennsylvanian strata and the work is being carried on in Texas, Oklahoma, Kansas, Iowa and Nebraska.

Dr. Plummer said it was too early to announce results but the initial work shows new contact lines and new outcrops never before placed on a published map. He stressed the fact that the accuracy and completeness of the final results depend entirely upon the co-operation of all members of the association. Geologists are working on maps of 35 counties in Texas. Twelve have been completed and three are ready for distribution.

As one means of stimulating the interest of the younger geologists to take a more active part in association work the research committee is centering its efforts on making awards for meritorious work. Probably the highest award to be made will be the I. C. White gold medal. It will be made for distinguished service in petroleum geology and all geologists are eligible to win it.

The late Doctor White was the originator of the theory of anticlinal accumulation of oil and gas. It is planned to make the awards retroactive to the date of organization of the association which is 14 years old and would permit the awarding of 14 medals. Awards will be made annually and the winner can receive the honor only once. The committee making the awards would probably be comprised of past presidents.

By a unanimous vote the geologists decided to defray all convention expenses in the future. In the past they have been aided in this expense by oil companies. In the future these expenses will be defrayed, either in part or whole, by a registration fee. At the Fort Worth meeting a small registration fee was made.

It was voted to continue the present method of electing officers for at least two more years. Minor changes were made in the constitution and by-laws affecting the election of distict representatives and membership of the technical sections.

President McFarland's Address

R. S. McFarland, of Tulsa, retiring president, said in his address that petroleum geology has probably reached its saturation point considering the number of specialized branches of the industry. Adding to that he said the association has reached such a size that it is not necessary to continue canvassing for new members but at the same time it should be on the alert for high-class members

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NEW HEAD OF GEOLOGISTS WAS PIONEER

One of the oustanding characteristics of John Young Snyder, Shreveport, newly elected head of the American Association of Petroleum Geologists, is his democratic spirit. Throughout Louisiana and Arkansas he is known familiarly as "J. Y."

John Young Snyder

Mr. Snyder was born in Winnsboro, Franklin Parish, Louisiana, January 30, 1873, and obtained his education at Vanderbilt and Tulane Universities. At the age of 16 he interested himself in geology, but in those days the opportunities of the petroleum geologist were limited to say the least. Nevertheless he made a hobby of geology while finishing his courses in structural engineering.

Back in 1912 he started applying his geological training to the production of oil and gas and a few years later he abandoned the engineering profession and entered the oil business. His success in that field has been remarkable, and among the discoveries with which he is credited are the Homer and Haynesville Fields in North Louisiana. He is said to have discovered more fields in that area than any other geologist.

While one of the veteran geologists in Louisiana and Arkansas, he also enjoys the distinction of being one of the first to do subsurface work. He is of a modest nature, but energetic and progressive and always has been a friend to the young geologist in more ways than one.

Closely related to his success in professional work has been his success in business administration. He is an oil producer, planter, director in two Shreveport banks and reputed to be one of the wealthiest men in Shreveport. With all of the duties connected with the administration of those affairs he finds time for periodical trips to the field, visiting friends made in earlier days in the oil industry.

A. Roger Denison

F. H. Kay

Big Demand for Antiknock Gasolines

No Exclusive Territory for Ethyl Gasoline After April 1. Changing Plant Operation to Secure Satisfactory Product From Crude

By C. O. Willson

The termination of the exclusive contract of the Standard Oil Co. of Indiana covering the sale of Ethyl Gasoline in 10 States of the Middle West, coupled with the fact that the season of maximum gasoline consumption is near, has brought the subject of antiknock gasolines to the fore in refining and marketing circles throughout the entire country.

The Standard of Indiana contract with the Ethyl Gasoline Corp. expires on April 1, bringing an end to an agreement which gave the Indiana company the exclusive right for the sale of Ethyl Gasoline in Illinois, Iowa, Minnesota, Wisconsin, Michigan, Indiana, North Dakota, South Dakota, Missouri and Kansas. These 10 States purchase approximately 30 per cent of all the gasoline consumed in the United States.

The contract of the Indiana Standard was the last of the exclusive agreements and, according to the Ethyl Gasoline Corp., after April 1, "there is no territory in the United States which is not now open to refiners of a substantial nature on a nonexclusive basis."

That the Standard of Indiana will have strong competition in its future sale of Ethyl Gasoline is evidenced by the licenses which have been issued recently by the Ethyl Gasoline Corp. Among the companies which have been granted permission to sell Ethyl Gasoline in all or part of the Standard of Indiana territory are the Bolene Refining Co., Bartles-Maguire Oil Co., Independent Oil & Gas Co., Johnson Oil Refining Co., Producers & Refiners Corp., Root Refining Co., Tidal Refining Co., White Star Refining Co. and the White Eagle Oil & Refining Co. Some of these companies previously had been licensed to sell Ethyl Gasoline in other sections of the country where exclusive contracts have not been in effect.

The Bartles-Maguire, Independent, Johnson, White Star and White Eagle companies have large distribution in the Standard of Indiana territory. After April 1 they will offer their customers Ethylized gasoline as a premium product through their own stations in competition with the Standard company which will continue the sale of the product at practically all of its stations. In most cases the independent companies also will offer Ethyl Gasoline to their jobber customers.

Several refinery organizations operating in other parts of the country also have secured licenses and will distribute the product to the retail and jobbing trade. In addition to the developments pointing to an enlarged consumption of Ethyl Gasoline there are also many positive indications that the sale of other antiknock gasolines will increase. Many refiners believe they have perfected a gasoline in their refinery operation which is the equivalent or better than Ethyl Gasoline and the quantity of this material available unquestionably will increase steadily throughout the remainder of the year.

Probably every reader is familiar with the major developments over the past four years in the sale of Ethyl Gasoline. The gasoline is distributed by licensed refiners and marketing organizations which are required to maintain an established antiknock rating in the gasoline by the use of tetraethyl lead. The manufacture and sale is controlled by the Ethyl Gasoline Corp. The latter corporation is owned by the General Motors Corp. and the Standard Oil Co. of New Jersey.

The sale of Ethyl Gasoline has spread rapidly during the past three years and its sale is now general in all parts of the country. The gasoline sells at a 3-cent premium over the ordinary domestic grades. In the beginning, exclusive contracts for the sale of the product in certain areas were given by the licensors but as previously stated the policy over the past two years has been not to give the exclusive sales rights but to license any refinery operator who would fulfill the several requirements in regard to manufacture and sales.

Emphasized Knock

The introduction of Ethyl Gasoline is generally credited with bringing about important changes in both the automobile and oil industries. In the automobile industry it has made possible the design of high-speed engines with a compression ratio which would have been impractical a few years ago. The new type engine gives the quick "pick up" and high speed without engine knock demanded by the buyers of new cars. In the old model cars antiknock gasolines eliminate the carbon knock and otherwise give smoother operation.

The following table shows how the compression ratio has been increased over the past three years in several of the well-known makes of automobile:

Compression Ratio

Name of Car—	1929	1926
Auburn	5.25	4.5
Buick	4.3	4.2
Cadillac	4.3	4.2
Chevrolet	5.01	4.3
Dodge	5.18	4.0
Ford	4.2	3.9
Hupmobile	5	4.8
Studebaker	4.95	4.5

The trend toward higher compressions is not a unanimous development among car manufacturers. A few have not increased their compression ratio and three cases are cited where the ratio has been lowered in the 1929 models. There has been considerable research work among car manufacturers in regard to detonation and it is claimed that some progress has been made toward the elimination of this objectionable feature through changes in engine design. The purpose of this investigation is to develop an engine which will not require special motor fuels.

Regardless of what this research work will develop in the future, at present the cars with the high compression engines give the best service when a motor fuel with a high antiknock rating is used.

New Ford

In many cases the car manufacturers and dealers frankly recommend to their customers that they use Ethyl Gasoline or some other antiknock gasoline. The new Ford with its higher compression ratio has added very materially to the demand for antiknock motor fuels. The Ford company does not recommend the use of special gasolines but many of the dealers do. Many thousands of Ford owners are outspoken in their recommendation of antiknock gasolines after tests have been made with several types of fuels.

The same situation applies in operation of several other types of cars including some of the most expensive models. Within the oil business there have been those who accepted the scientific fact that differences existed in the detonating qualities of motor fuels, but who doubted that the average car owner would be able to notice it in driving his car. The fact that the consumption of antiknock gasolines has steadily increased tends to discount the predictions of these skeptics and support the views of those who have predicted the oil business would have to make a gradual change in its refining and marketing methods so as to take care of a constantly increasing demand for gasoline which did not knock and gave the car the greater pickup, more power and other advantages claimed for the new type engines.

Statements made in recent months by automotive engineers and executives indicate that the present trend in engine will continue. Walter P. Chrysler, head of the Chrysler interest who has been a pioneer in the use of high compression engines has stated that this type engine is essential to give the performance demanded by the car owners. Economy both in manufacture and operation are claimed for the car with the high compression engines.

Oil Industry Viewpoint

The oil industry's position has been one of endeavoring to keep pace with the demands of car manufacturers and owners. It has brought out numerous changes in both the manufacturing and marketing departments of companies. When Ethyl Gasoline was introduced with the exclusive contracts the efforts of the companies who could not offer the product naturally was to find a substitute.

It is not necessary to explain in detail here what has happened in refinery operations. During the past four years plant operators have found that the antiknock rating of their gasolines is largely dependent on manufacturing methods and the type of raw material from which it is obtained. In general, cracked gasolines are superior to the so-called "straightrun" gasolines when both are obtained from the same grade of crude oil. As to the crude oils the asphaltic and naphthene base crudes are superior to the paraffin crudes as raw material either in the skimming or cracking operation.

Among the cracking processes the so-called "vapor phase" cracking gives a better antiknock gasoline than the liquid phase cracking. The great majority of the cracking installations in operation at present are of the liquid phase type. However, the line of demarcation between these two types of cracking processes has lost part of its previous significance so far as the manufacture of antiknock gasolines are concerned. By making minor changes in the design of their liquid phase cracking stills, including the method of treating, several refiners have been able to very materially increase the antiknock value of their gasolines.

At the same time a close study has been made of the numerous grades of crude oil which are available in the United States and foreign countries. In both the skimming and cracking operation certain crudes are superior to others in the manufacture of antiknock gasolines. For instance, the bulk of the California, West Texas, Gulf Coast and Smackover crudes are preferred to the paraffin or mixed base crudes of Mid-Continent and Pennsylvania.

Gasolines From Crudes

By selecting the proper crudes or perfecting their manufacturing operation or both several refiners have been able to refine a gasoline which they are offering to their customers as an antiknock gasoline. In fact, these gasolines constitute practically the only competition of Ethyl Gasoline. When Ethyl Gasoline was first introduced the distributors were flooded with "dopes" to be mixed with gaso-

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FIFTY COMPANIES NOW LICENSED TO DISTRIBUTE ETHYL GASOLINE

Following is a list of companies licensed to sell Ethyl Gasoline by Ethyl Gasoline Corp.:

The American Oil Co., American Building, Baltimore, Md.

American Oil Works Co., Titusville, Pa.

Anglo-American Oil Co., Ltd., 36 Queen Anne's Gate, Westminister SW 1, London, England.

Ashland Refining Co., Ashland, Ky.

Associated Oil Co., Associated Oil Building, San Francisco, Calif.

Atlantic Refining Co., 260 South Broad Street, Philadelphia, Pa.

The Bartles-Maguire Oil Co., 624 South Michigan Avenue, Chicago, Ill.

Beacon Oil Co., 30 Beacham Street, Everett, Mass.

Bolene Refining Co., Enid, Okla.

Burford Oil Co., Shreveport, La.

Continental Oil Co., Continental Oil Building, Denver, Colo.

Continental Refining Co., Oil City, Pa.

Crystal Oil Refining Corp., Shreveport, La.

Fleet-Wing Oil Corp., First National Bank Building, Bellaire, Ohio.

The Freedom Oil Works Co., Freedom, Pa.

Humble Oil & Refining Co., Houston, Tex.

Imperial Oil, Ltd., 56 Church Street, Toronto 2, Ontario, Canada.

Independent Oil & Gas Co., Philtower Building, Tulsa, Okla.

Johnson Oil Refining Co., Midland Building, Chicago, Ill.

Kendall Refining Co., Bradford, Pa.

Liberty Oil Co., Ltd., 518 St. Charles Street, New Orleans, La.

Louisiana Oil Refining Corp., Shreveport, La.

Mexican Petroleum Corp., 122 East Forty-second Street, New York, N. Y.

A. D. Miller Sons Co., Pittsburgh, Pa.

Pennsylvania Refining Co., Karns City, Pa.

Pennzoil Co., Oil City, Pa.

Producers & Refiners Corp., Independence, Kans.

The Refiners Oil Co., Dayton, Ohio.

Richfield Oil Co., Bartlett Building, Los Angeles, Calif.

Root Refining Co., Commercial National Bank Building, Shreveport, La.

Shreveport-El Dorado Pipe Line Co., Shreveport, La.

The Solar Refining Co., Lima, Ohio.

Standard Oil Co. of California, Standard Oil Building, San Francisco, Calif.

Standard Oil Co. of Cuba, 26 Broadway, New York, N. Y.

Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, Ill.

Standard Oil Co. of Kentucky, Louisville, Ky.

Standard Oil Co. of Louisiana, New Orleans, La.

Standard Oil Co. of Nebraska, Omaha, Neb.

Standard Oil Co. of New Jersey, 26 Broadway, New York, N. Y.

Standard Oil Co. of Ohio, East Ohio Gas Building, Cleveland, Ohio.

Standard Oil Co. of Pennsylvania, 26 Broadway, New York, N. Y.

Sterling Oil Co., Emlenton, Pa.

Texas Pacific Coal & Oil Co., Fort Worth, Tex.

Tidal Refining Co., Tulsa, Okla.

Tide Water Oil Co., 11 Broadway, New York, N. Y.

Union Oil Co. of California, Union Oil Building, Los Angeles, Calif.

Waverly Oil Works Co., Fifty-fourth Street, Pittsburgh, Pa.

White Eagle Oil & Refining Co., Kansas City, Mo.

White Star Refining Co., Detroit, Mich.

Wirt Franklin Petroleum Corp., Ardmore, Okla.

East Texas Getting Geophysical Play

Torsion Balance Being Used Extensively in Rechecking Interior Salt Domes. Work of Geologists Expanding

By R. Van A. Mills
Petroleum Engineering Editor

FORT WORTH, Tex., Mar. 24. — At the fourteenth annual convention of the American Association of Petroleum Geologists held here last Thursday, Friday and Saturday, it was apparent that developments in the geophysical methods of finding oil are occurring rapidly and that extensive salt dome regions in Texas previously studied by geophysical methods are yielding discoveries of deeply buried salt domes when reworked more intensively. In this work slight anomalies indicated by seismic methods are being followed up by the torsion balance with the result that certain types of deep domes missed by seismic methods are being found by the torsion balance in the Gulf Coast region.

Probably the greatest play by geophysical methods in the United States at this time is occurring in East Texas where several of the larger companies are at work. In the Gulf Coast region there is already a large crop of newly discovered domes with deep dry holes on some of them and there are indications that the main play is shifting quietly, though vigorously, to the interior salt dome region of East Texas. Geophysical methods are also being used in West Texas, New Mexico, Arkansas, Louisiana, and to a limited extent in California, Oklahoma and Kansas.

The Trend of Thought

From the variety and quality of the papers and discussions presented, the unprecedented attendance, the pep and snap in the technical sessions, the interest and enthusiasm shown, and the conversations and informal discussions outside the meetings, it was apparent that the science of petroleum geology, like the petroleum industry itself is expanding and dividing itself into many specialized fields of work. Some of these have been developing for many years, others are new. All of them have enormous possibilities in the scientific and practical phases of oil finding.

The trend of thought is clearly toward more thorough studies of stratigraphy, folding, faulting and the correlation of formations. New importance is being assigned to depositional effects, the sedimentary character or origin of the reservoir rocks, source beds, and associated strata with particular reference to the limestone beds of coral-reef origin in West Texas. In all of this work palentology, especially micro-palentology, is playing an important part.

The more technical branches of petroleum geology such as the development and use of geophysical methods and the advances being made in the technology of geophysics occupied the center of the stage. Coring and studies of cores, the physical examination of oil sand cores, the correct orientation of cores, the crooked hole problem and the drilling of straighter holes, the surveying of deep wells, production methods in the shale-gas industry, stratigraphic data, and other facts revealed in deep wells, overproduction and other problems in economics, developments in Venezuela with particular reference to their overproduction menace and the competitive position of Venezuelan crude compared with that of Mid-Continent crude on the Atlantic Seaboard were discussed in detail. One impression left by this convention is that petroleum geology is becoming more and more closely allied with petroleum engineering on the one hand and with the economics or business of oil production on the other. It appears as if the petroleum geologist is becoming almost too good; he is finding more oil than the industry can absorb.

The following impressions were obtained from the meetings and from a conversation with Dr. Donald C. Barton of Houston. To begin with, it is difficult to check up on the results and the relative degrees of success attained with different geophysical methods because only a relatively small proportion of the results of the work are now available. One important thing is the trend toward the more intensive application of the torsion balance which has recently picked up a number of deep salt dome structures that had been missed by seismic methods. This trend was brought about largely by the discovery of the deep Dewalt salt dome otherwise known as the Sugar Land Dome, situated approximately 25 miles southwest of Houston. This dome was discovered by the torsion balance after being previously missed by seismic methods. The fact that it was later picked up by seismic methods, too late for acquisition, in no way detracts from the prestige gained by the torsion balance.

Magnetometer work is the least expensive for field mapping but if the cost of the dry holes drilled largely upon magnetometer recommendations were included in the calculations, the magnetometer might prove to be the most expensive. Geophysical methods in petroleum geology are too new to have built up much of a background upon experience. Such work is today about where structural petroleum geology was 15 years ago. Consequently the geophysicist can not reasonably be expected to interpret as much from his isogams (lines of equal gravity or equal magnetism) as the structural geologist can interpret from his contours. It is frequently difficult for the geophysicist to get enough geological information to accompany and form a framework for his geophysical data. The magnetometer and the torsion balance obtain information, or as Doctor Barton expressed it, they see clear through the sedimentary beds to the basement rocks or even into the basement rocks, the data thus obtained being the summation of the effects of all of these rocks. But when it comes to correctly interpreting these data the problem is both complicated and difficult. The geologist may not really know very much about deep subsurface conditions that he thinks he knows a lot about. The physicist usually knows little about geology and the geologist may know less about physics so that the interpretation of geophysical data is not as accurate as it should be. The point

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Oppose New Regulations on Permits

Governors of Rocky Mountain States and Operators Criticize Federal Policy Governing Oil on Public Domain

By Tolbert R. Ingram

DENVER, Colo., Mar. 23.—Another week has passed since President Hoover issued his statement outlining the administration's policy on the conservation of oil on the public domain and the operators, permit holders, applicants for permits and others affected by the new policy are as much at sea as before as to where they stand and what will be the outcome. The first impression of surprise and anxiety has given way to doubts and fears and in some instances to alarm as to what effect it will have on the industry in the Rocky Mountain states.

Conference of Governors

A concerted move by the governors of the Rocky Mountain states to meet the issues raised by the Washington administration's new policy was set in motion by Governor Frank Emerson of Wyoming, who is trying to arrange by telegraph a conference of the executives of Wyoming, Colorado, Utah, Montana and New Mexico. It probably will be held in Denver early next week, that city being selected on account of the condition of Governor W. H. Adams, of Colorado, who is convalescing from a long illness.

Governor Emerson was in Denver a few days ago in conference with Governor Adams regarding a concerted protest. Upon his return to Cheyenne he wired the governors of the five states urging that they get together at once as the new policy of the Federal administration is being put into immediate effect. Governor Adams has taken a public stand against the new policy which, he declares, will bar or hinder development of one of the most important resources of Colorado.

Attitude of Oil Men

Fred W. Freeman, counsel for The Texas Company in this territory, and Edward W. Freeman, with the legal department of the company in New York, have been in Washington for several days conferring with officials of the Interior Department concerning extension of permits in Lea County, New Mexico. It is understood applications for extensions were made prior to the announcement of the administration's new policy and that these will be among the first considered by the department under the new rulings. The Texas Company has drilled 11 wells in southeastern New Mexico, some of which were put down under the co-operative plan and 3 of which made discoveries of oil or gas. The decisions to be made on these permits may indicate just how far the administration intends to go in enforcing the new policy to the letter and the results will be awaited with considerable interest.

Executive officials of the oil companies are hesitant in going on record regarding the situation due to the fact that all of them are directly affected by the new rules and have matters pending before department officials and do not desire to arouse any spirit of antagonism. There is a feeling among them that perhaps misunderstandings exist as to the position of the Washington officials and that when the situation is clarified matters may not be as bad as they are pictured at present.

A composite picture of the situation as it is at present viewed in the public land states is something like this:

The oil man who has no permit to prospect has been barred from entering the public domain to search for oil or gas. If he is a holder of a permit he must drill at once or have the land taken away from him. If he drills the land under his permit and makes a discovery, three-fourths of what he held, and to which he has given immense potential values, may be taken away from him indefinitely or permanently. That puts him rather literally "between the devil and the deep blue sea." He may "be damned if he drills and damned if he doesn't."

A special meeting of the board of directors of the Rocky Mountain Oil and Gas Association, representing Colorado, Wyoming, Montana, New Mexico and Utah, was held at Casper on a call from President B. B. Brooks, at which the situation was discussed and a resolution was adopted which concluded requesting "a hearing prior to the adoption of any regulations to present data as to the effect of said conservation policy on the development of oil and gas lands in these public land states of the Rocky Mountain region together with an opportunity to confer and advise with respect to such new regulations for carrying such policy into effect."

Copies of the resolution were wired to President Hoover, the governors and congressional delegations of the five states and the Secretary of the Interior. The preamble stated that the Rocky Mountain public land states are wholeheartedly in favor of true conservation and will support all conservation policies giving the greatest use without waste of their natural resources for the benefit of all the people. It pointed out that the five states represented by the association now produce daily 68,000 barrels of oil or 2½ per cent of the total production of the United States, one half of which is produced in Salt Creek where true conservation policies are successfully practiced. The association claimed the present oversupply of crude petroleum is not caused by overproduction in these states and constant and persistent exploration and development are essential to insure sufficient oil production for our immediate requirements.

In Colorado Legislature

This action was followed by the introduction of a joint memorial in the Colorado legislature and which is now pending which says:

"Whereas the President of the United States, through the Secretary of the Interior, proposes to lay down new rules governing the location and development of oil lands on the public domain, and

"Whereas the state of Colorado is in accord with the general policy of constructive conservation without waste, yet is desirous of protecting the rights of its citizens in developing its natural resources as provided by federal statutes; now, therefore, be it

"Resolved, by the house of representatives, the senate concurring, that the President be requested to grant hearings to accredited representatives of the industries of the west, especially the oil industry, to the end that all matters pertaining to the location and development of oil and other minerals on the public domain may be fully discussed that there might not be any injustice to the citizens of Colorado or to the state of Colorado."

Press dispatches from Washington indicate that the Secretary of the Interior will not wait for a hearing on the new policy before putting it into effect in as much as a new set of rules, 13 in number, were promulgated as follows:

New Federal Rules

1. All oil and gas applications and

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Reclaiming Lease Which Made Millions

Small Tract in Old Humble Pool on Gulf Coast Wonderful Example of Economical Operation. Deeper Drilling Lure to Owner

By Neil Williams

HOUSTON, Tex., Mar. 25.—A reversion of an old expression, "gone but not forgotten," might be applied fittingly to several once famous leases in the old Humble Field in the form of "forgotten but not gone." At least, several of these old leases, years ago thought played out and all but abandoned, today are being reclaimed, and it is not at all unlikely that they may make fortunes over again for their owners.

T. W. Horn (left) and Jack Martin, driller and holder of quarter interest in Mr. Horn's Humble property.

Leases, some of the oldest at Humble, itself one of the pioneer fields of Gulf Coast history, which have made their millions for former owners and which once figured in the early day tales of glamour and romance, have lain unheeded for years, little sought and unwanted, except by a few who had faith in them and believed that some oil fields, like some men, could get down but not out.

Rejuvenated, old wells worked over and new ones drilled, these leases, long considered as "have-beens," continue to grind away and under careful operation are being made to bring in profitable returns again to their owners, not in the big producers as of old but in consistent small pumpers.

Herein lies the tale of one of these once famous leases in the old shallow field of Humble and its present owner for the second time, T. W. Horn, Houston operator, whose chief aims and fondness are wrapped up in the tract, which he expects to stage a sensational comeback in possible deeper sands, as yet untouched, in addition to making a handsome living for the present off the gleanings from the former prolific shallow sands.

Lease Has Yielded Millions

This land, which Mr. Horn now is reclaiming, in the early days of the field made a few millions from its prolific shallow production for the late Neils Esperson, whose successes stand commemorated by a Houston skyscraper bearing his name and built by the fortune started on that same tract. It lies on the west side of the field and consists of one 25-acre piece, formerly the Herman estate, but which now is in two tracts, Mr. Horn owning the north 12½ acres in fee and leasing the south half, and in addition a group of one-acre tracts situated just to the north.

Mr. Esperson, through the Starlight Oil Co., operated on this property from 1907 to 1915, and the first producer completed, the No. 1 Holmes, on one of the acre tracts to the north still is pumping about 4 bbls. daily, setting a record for longevity at Humble. Completed in 1907 it is claimed to be the oldest producing well at Humble.

Although this well has been expected to play out at any time, it still maintains its production and never has made anything but pipe line oil despite the fact that all other wells there now make large quantities of salt water. Neither has the well ever had to be worked over other than to pull and replace rods. The initial production of the well was only 35 bbls. daily on the pump, making the present output of 4 bbls. daily a comparatively large figure considering the life of the well. The production is from a sand around 1,100 feet.

On Mr. Esperson's property occurred one of the worst blowouts in the history of Humble. That was No. 1 Herman in the SE cor. of the property, which blew out while drilling about 800 feet, creating a crater which swallowed the derrick, rig and everything else in the immediate vicinity. The water-filled crater now stands as a large lake.

The Starlight Oil Co. drilled a few other wells in that vicinity and almost on the edge of the crater completed one producer which flowed 3,000 bbls. of pipe line oil daily for a long time. However, since those first wells were drilled and later played out, that part of the lease never has been redrilled, but this Mr. Horn expects to do in the near future.

Sold Property in 1915

In 1915, after a dozen wells had been drilled, more than a million barrels of oil had been taken from the ground, and the property had begun to shown signs of playing out, the Starlight Oil Co. readily offered to sell out "stock and barrel" for $32,500 to the Hoffman Oil Co., of which Mr. Horn, the present owner, was treasurer. The deal included the No. 1 Holmes, previously mentioned as the oldest continuous producer at Humble.

The Hoffman company started right in on an active redrilling program, not only in working over the old wells but in drilling a number of new wells. In all, the Hoffman company drilled 11 additional wells, six on the Herman lease on the south and five on the fee ownership, the north half of the 25-acre tract.

Although it had been thought the lease had been thoroughly drilled and that salt water encroachment would make much further operation of the property unprofitable, the Hoffman company succeeded in building up the daily oil production to 1,400 bbls. in a period of five months. Then, a successful venture or not, the Hoffman company could not turn down a cash offer of $350,000 and on March 17, 1926, sold out to the Gulf Coast Oil Corp. The property costing only $32,500, the company made a clear profit of $317,500 in five months, not counting the returns from oil production during that period. Of the sale profit, $60,000 was Mr. Horn's share.

Mr. Horn Buys Property

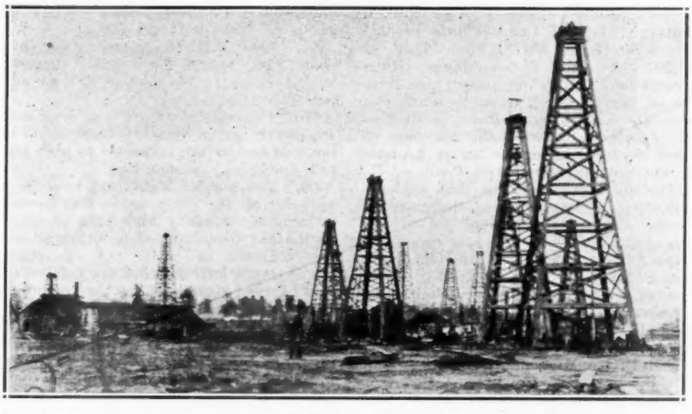
The Gulf Coast Oil Corp. operated on the property until May, 1928, but for some reason it claimed it could not make any money and offered to sell out for $10,000. Thinking the property again virtually played out, no one seemed to want it except Mr. Horn, who bought it back for a fraction of what he had sold it for.

Mr. Horn's statement at that time that he had made one fortune on the lease when everyone else had thought the lease was through but that he was going to get another out of it evidently is true because in less than a year's time he already has turned down one offer equal to the amount he obtained when the Hoffman company was sold.

Mr. Horn works something like the Biblical gleaners who gathered up the remaining stalks of grain in the field after the harvesters had passed. The early operators in this shallow sand and cap rock area of Humble took the prolific production from those formations. Mr. Horn goes back and gathers up the scum of oil which seems to accumulate between each redrilling.

Although confident that deeper sands exist which may bear considerable new production, Mr. Horn is confining his work to the shallow sands down to 1,100 feet, which is the deepest depth, except in one test, to which any drill has gone on this property. Previous operators never had given much thought that deeper sands might exist despite the fact that the cap rock and salt of the dome have been touched only on the extreme northeastern edge of the lease.

Mr. Horn is redrilling steadily the entire property, putting down new holes adjoining and as near as possible to formerly abandoned wells, keeping in line with the trend of the series of sands which apparently run from northwest to southeast across the leases. He has found that oil keeps coming back into the sand from somewhere after the sand has been pumped dry of oil and that in the time which elapses while working over an old hole or drilling an adjoining new one enough oil accumulates to make a small but profitable pumper. A well lasts from three to four months before requiring working over.



Section of the Horn property at Humble showing shallow sand pumpers and power house at left.

Source of Oil Not Known

Where the oil keeps coming from Mr. Horn does not know, but he says he is sure that it is seepage from some prolific source from where heavy pressure forces it up into the shallow sands. He says the sand he is working is a water sand only, as it is clean and blue and that all the oil which has been taken out before has been that which has been forced into it from somewhere else.

Oldest producing well in Humble Field, No. 1 Holmes, completed in 1907 and still pumping.

This, Mr. Horn explains, is how he has been able to make money by redrilling over and over again an old property. When previously operators took off the accumulated oil, leaving only salt water in the sand, they evidently figured the property played out for good. Mr. Horn depends on the salt water, a thing which has condemned the property before, for his production; the more salt water pumped out the greater the amount of oil seeping in and recovered. By low cost of operation, the separation of the oil scum from the salt water has proved very profitable.

The daily net oil production from the property today is approximately 40 bbls., but by drilling a string of new shallow wells Mr. Horn hopes to increase this amount to 100 bbls., basing his hopes on the percentage of his past successful wells. Although the property had been considered as drilled up, Mr. Horn points out that much of it really has been scratched by the drill, previous operators having feared the salt water, a thing which really is the most important medium in recovering the oil.

Operation costs have been reduced to an extremely low item by Mr. Horn, which accounts for the profit he has shown from his venture. Due to a simple and inexpensive but ingenious use of an old, discarded boiler, he traps enough gas from an artesian water well to run a 35-horsepower gas engine which pumps all the wells. This makes the pumping cost practically nothing. The artesian well

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Crooked Holes Next Important Problem

Second Only to Overproduction in Opinion of Geologist. Methods Proposed to Deal With Difficulty

By Frederic H. Lahee*
Chief Geologist, Sun Oil Co., Dallas, Tex.

Only second in importance to the problem of overproduction is the problem of crooked holes. To some this may perhaps sound like a gross exaggeration, or like a fall from the sublime to the ridiculous; but when we consider how many holes have been drilled off the vertical, and, where such is the case, what large sums of money have been lost in drilling operations, in producing operations, in false or inadequate geological interpretations, and in erroneous technical deductions based on assumed well spacing—when we consider the almost endless ramification of these opportunities for loss, we can better appreciate the significance of this problem.

Probably few holes have been drilled absolutely vertical. The real wonder is that so many are comparatively straight. But we are not so much concerned now with the holes of yesterday, which were relatively shallow, and which were no doubt for the most part sufficiently straight for all practical purposes. We are concerned with the holes of today and tomorrow, holes which are being carried to depths of anywhere from 5,000 to 8,000 feet and which will soon be reaching down nearly 2 miles into the earth. These are the holes which we must drill vertical, for otherwise our plans and aspirations, based on promising surface or shallow subsurface evidence, will be worth nothing. If 3,000 and 4,000-foot holes can wander off horizontally scores or even hundreds of feet from where they started, what is not possible in an 8,000-foot hole? It is for this reason, then, that I say that the crooked hole problem, the problem of how to survey the courses of holes and how to drill them straight, is the second most important problem before the industry today.

Course and Shape of Crooked Holes

Much has been written concerning the course and the shape of crooked holes. As a matter of fact very little accurate information is available on this subject, especially in regard to holes drilled for oil, for the simple reason that very few wells have been surveyed by a precise method of measuring angles and directions of deviation.

The consensus of opinion seems to be that holes have a tendency to corkscrew in a clockwise manner, this being due to the clockwise rotation of the bit.

The conclusion would seem to be that, while there is a mechanical tendency, due to the rotating bit, for the hole to corkscrew in a clockwise direction, actually this tendency may be weakened or entirely prevented from acting by local geological or mechanical conditions which are more effective than the mere turning of the bit. Whether the hole corkscrews, or wanders irregularly, the horizontal projection of the drift is commonly open, so that the greater proportion of the horizontal migration is in a fairly definite direction. In other words, when the drift is considerable, there is very small chance that the bottom of the hole will be near a vertical line through the mouth.

Deflection and Dip

Another phase of this question of the course of the hole bears upon the relation between the direction of deviation and the dip of the bedding. This subject is as important as it is interesting.

One man experienced in diamond drilling, writes: "If the bit strikes a very hard stratum at a very acute angle, it tends to follow along the plane of the stratum. If it strikes this hard layer at a fairly obtuse angle, the result is exactly the opposite."

In Peele's handbook we read, "When the angle between direction of hole and dip of strata is small, the hole tends to parallel the strata; when great, tendency is to penetrate strata at right angles."

Kitchen states that all 21 diamond drill holes which he studied in detail were deflected in an updip direction with reference to the strata.

Even in cable-tool drilling, an updip migration has been observed.

The reason for this is easy of explanation. If the rotating bit, which has been drilling in a soft formation, encounters a hard, resistant layer, and if the beds have a moderate dip, the updip edge of the bit is checked, while the downdip edge is still in soft material. If there is any play between the drill stem and the hole, as there generally is, this resistance tends to cause the stem to bend under weight and to bow downdip, so that the bit is cutting more nearly perpendicular to the bedding. The bigger the hole is in relation to the size of the drill stem, the more opportunity would there be for this effect. On the contrary, if the strata dip steeply, such a hard layer would function like a wedge, forcing the bit to slide down its face while continuing to cut in the soft rock.

Whether the bit has the tendency to cut in an updip direction or in a downdip direction, will depend upon the relations between several factors, such as size of hole, size of bit and drill stem, weight on bit, dip of bedding, difference between resistance of soft and hard layers, etc.

Effects of Crookedness of Holes

The effects of the crookedness of holes are of several kinds. Some are mechanical; some concern production; some have to do with engineering practice; some are purely geological; and so on. A majority of these effects, however, can be classified as either mechanical or geological. Ultimately all of these are directly or indirectly financial.

Mechanical Effects

We are not going to enter into detail regarding the mechanical effects of crooked holes, since this is more properly a subject for consideration by others than geologists. Nevertheless, we should be neglecting a very important phase of our discussion if we should omit this topic.

Mechanical troubles are exaggerated by rather abrupt changes in the course of the hole. Where the deviation takes place in a broad curve, difficulties may not be experienced, or they may be so slight that they escape notice; but whether observed or not, in every hole which is off the vertical there must be more or less irregular wear.

As a result of bends in the hole, the drill stem may twist off. Difficulties may be experienced in running the drill stem, in pulling out the drill stem, in running casing in open hole, or in running one string of casing in another. The pipe may collapse or part. The sides of the hole may cave, due to rubbing. Where a steel cable is used, as in cable-tool drilling or in swabbing operations, the cable may wear through casing which has been set. After a well has been put on the pump, there may be trouble with broken rods and rod-cut tubing.

Other mechanical difficulties might be mentioned. All along the line, almost from the time the hole is spudded in until it is completed as a well, and from the time it begins to yield until it ceases to be a commercial producer, these mechanical difficulties in connection with crooked holes are numerous and sundry. Obviously their cost must run into large sums of money.

Geological Effects

Under the term "geological" we are including all those effects of the crookedness of holes which may be related to geological deductions and recommendations concerning possibilities of production, or to interpretations of geological structure or to other similar subsurface conditions.

In the light of what we now know about the deviation of bore holes, the care with which well locations are measured off and surveyed on the ground becomes almost a joke. Arguments are not uncommon as to a choice between two points, as little as 50 feet apart, for the location of the hole to be drilled to a depth of 3,000 or 4,000 feet. Indeed, how often is it not true that a location is surveyed just 1 foot more than the required distance in order to insure the correct offset spacing.

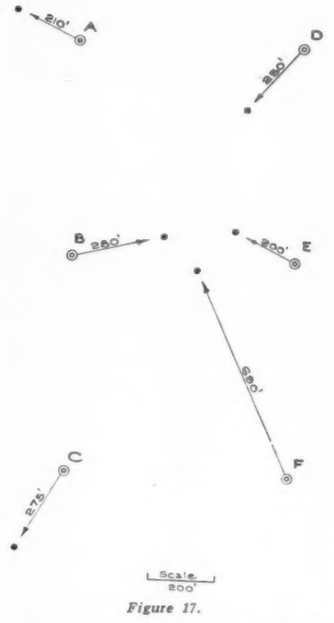

Figure 17.

Figure 17 is a diagram to illustrate a possible spacing of the bottoms of six holes which, on the surface are assumed to be 660 feet apart. The arrows show the supposed direction of the horizontal migration of these holes, and the amounts are indicated beside the arrows. None of these quantities is extreme. Now imagine that the petroleum engineer is going to use the production figures from these wells to study the decline of production, or to estimate the per-acre yield of a particular property, or to investigate problems of porosity and the rate of flow through the sand, or to plan a logical system of repressuring, or to undertake a dozen other similar problems, all of which are fundamentally premised on the measured spacing of wells at the surface

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*Before A.A.P.G. annual meeting, Fort Worth, Tex., March, 1928. (Published by permission of the American Association of Petroleum Geologists.)

TEXAS RAILROAD COMMISSION TO CUT HOWARD COUNTY PRODUCTION

DALLAS, Tex., Mar. 25.—The Texas Railroad Commission is expected to issue an order, effective probably April 1, cutting the allowed production of southern Howard County lime producing wells from 45,000 bbls. daily to 37,500 bbls. daily, in accordance with a recommendation of the advisory committee of the proration plan in that area. The contemplated curtailment is designed to conserve the field and to solve in some degree the serious water problem in the Roberts and Settles Pools.

The operators elected a new advisory committee because some of the members of the old committee could not always attend the meetings. The new committee is as follows: Frank T. Pickrell, Texon Oil & Land Co.; J. S. Cosden, J. S. Cosden & Co.; Robert Piner (chairman), representing Dora Roberts interests; Joseph Kilchenstein, Magnolia Petroleum Co.; Warner Clark, California Co.; G. H. McIntyre, Marland Production Co.; M. B. Sweeney, Sun Oil Co.; Arno Behnke, Amerada Petroleum Corp.; and George D. Morgan, American Maracaibo Co.

The engineering committee which has been studying water conditions in that area for several months reported at the last meeting of the advisory committee. The recommendation for a reduction in runs was made on the strength of that report, which follows:

Summary and Conclusions

"1. A particularly rapid encroachment of water occurred in the 3,000-foot pay soon after production started in the field.

"2. The order and quickness with which water appeared in scattered wells indicated an extremely rapid water encroachment up-dip without regard to structure contours.

"3. Apparently the flowing pressure is due mostly to the hydrostatic pressure originally occurring around the edge of the field. The gas-oil ratio is low, and a relatively small volume of gas is produced with the oil.

"4. The initial fluid level of oil (average 2,200 feet in four wells) suggests a rock pressure of around 850 pounds per square inch.

"5. The relatively high fluid level and apparently rapid flow of fluid towards the hole are factors favorable to high initial (pumping) production.

"6. The normal high fluid level in a well during the early production period maintained naturally high back pressure on the pay formation, thus retarding the encroachment of water. Or in other words, could have entered the hole when first drilled faster than the pumping equipment could handle it. As the drainage area near the well was depleted it gradually became possible to handle all the fluid coming into the hole and later to pump down the fluid close to the bottom of the well, thus creating a differential of some 800 pounds per square inch. Accordingly, a condition existed in the more or less open and permeable lime, very favorable to by-passing or channeling of the water through the oil bank.

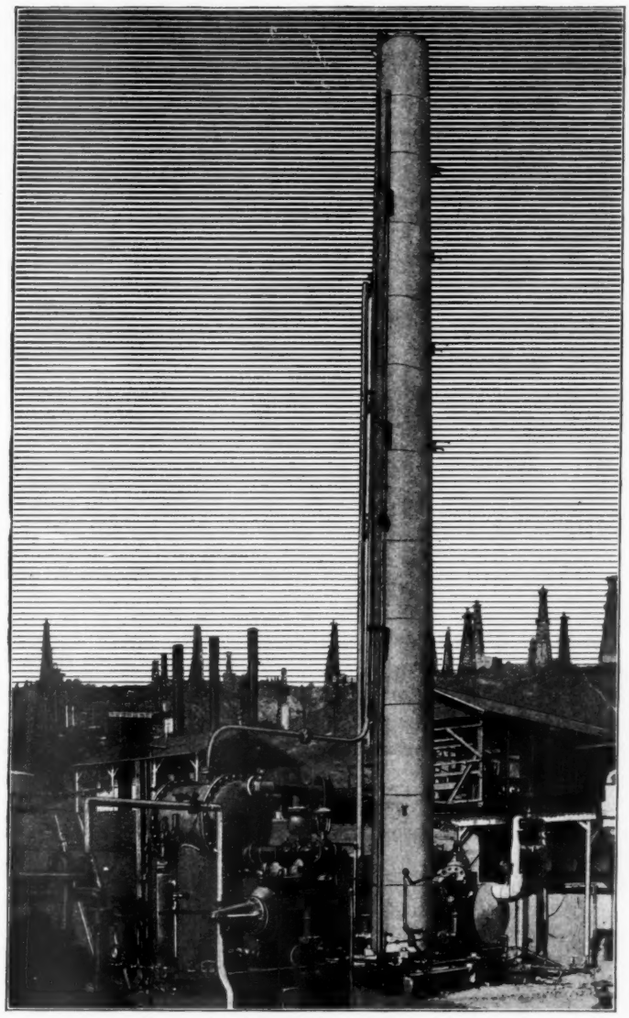
Oil Reservoir Closure

"7. The oil reservoir has a closure of approximately 160 feet (340-180). The proven area at this time, March, 1929, consists of approximately 2,500 acres. The full section of the pay zone probably averages 45 feet.

"8. The 3,000-foot pay zone possibly consists of two pay members, in that a number of the wells have logged an impervious lime or irregular thickness, separating the upper and lower pays. It is not definitely established, however, that

(Continued on Page 154)

LOSSES ELIMINATED



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GETTING AT COSTS

The plague of the gasoline business has been the scramble for gallonage, the stupidity of thinking that volume is the measure of business, rather than returns on what is sold.

Every neighborhood in the country is familiar with the little storekeeper who sets up for himself and lasts only until his money gives out because he does not know there is more to business than buying and selling.

The chain systems have hastened a lot of these little fellows out of the picture simply because the chains knew their costs while the little fellows didn't.

Any student of the gasoline situation in recent years must have wondered whether there was any real accounting system in the business because prices have ranged so widely it seemed impossible there could be such variance based on anything like similar costs.

This aspect was the subject of considerable discussion among those attending the meeting of the Western Petroleum Refiners' Association at St. Louis. It was felt that it is time some concerted effort was being made to establish a uniform method of cost accounting in the manufacturing end of the oil business.

The very complexity of the problem perhaps has been the chief deterrent from attempting to arrive at a uniform cost. In addition to differences in crudes, transportation conditions and similar factors there is the question of by-products to be considered.

Can an agreement be reached on what constitutes merely the manufacturing cost of a gallon of gasoline without regard to by-products, the subsequent question of price and its apportionment among the various products to be considered apart from the actual manufacturing expense.

Primarily this is the cost accounting problem as distinct from the adjustment of prices on the products.

If an understanding can be reached on what can be accepted as the actual cost of manufacturing we shall be in a fair way to getting a proper perspective of the whole situation in the gasoline business.

In the informal discussion at St. Louis it was suggested that a beginning might be made with an attempt to arrive at labor costs. These should be fairly uniform and might be taken as a basis for the inquiry.

The cost of power, of fuel and other items in the cost sheet could follow. With these fundamentals to work upon the cost accountant could advance to consideration of the more complex relationships of various crudes and yields in by-products.

But before getting that far the inquiry would, of course, take up the factors of depreciation, taxation, interest on the investment, transportation charges, obsolescence and replacement, the latter two the most frequently ignored, apparently, in the operations of price cutters.

Some of the methods employed in the scramble for gallonage indicate that little or no account can have been taken of either obsolescence or replacement. Yet plant depreciation is a notoriously important item in gasoline manufacturing.

In addition there is probably no industry where advances in methods and processes so quickly render equipment obsolete.

It has been calculated that the life of cracking stills is about five years, a depreciation of 20 per cent a year, not including a high maintenance cost. Of course, unless this loss is figured in the manufacturing cost each year the operator will find himself in a very few years obliged to replace his plant and with no money to do it.

But it is very clear to experienced manufacturers that this vitally important item cannot have been considered in many of the quotations used in the reckless campaign for volume of sales at ruinous prices.

Each crude, too, brings in a new problem the cost of which must be counted in the cost of manufacturing.

Flush production, perhaps easily accessible, may create a confidence that may prove disastrous in other conditions unless operations are kept on a strictly cost accounting basis.

This has evidently been often the case. Men go into the refining business in conditions that do not and cannot last and, without a definite cost accounting chart to guide them, are overwhelmed when these conditions change.

If they alone were the sufferers perhaps it might not be so important but their blunders react against the whole industry.

They dump their products upon the market at a price which has no true relation to actual manufacturing costs throughout the industry and thus force down prices below reasonable returns for everyone.

That is the interest of the whole industry in hoping for the eventual establishment of a uniform cost accounting system on manufacturing gasoline which will serve as a bed rock basis for the entire industry.

Once that is approximately established none but fools could disregard its plain warning.

No scrambler for mere gallonage could longer delude himself into thinking he was engaged in a prosperous season when the facts and figures showed that he was headed for disaster.

One of the big troubles for the oil industry has been the idea of so many in it or entering it that it is a get-rich-quick affair, with little idea of permanency. The discovery of oil, the hurried marketing of flush production, making hay while the sun shines with no thought for the rainy day, may account for the lack of forethought which makes men ignore costs they would consider in any other business.

And those who are in the business as a permanent investment or occupation have to compete with these happy-go-lucky adventurers who treat the business like a game and not as an industry.

Uniform accounting on manufacturing costs would serve as a warning how far competition could safely be carried. An industry properly posted on manufacturing costs would not be so easily stampeded by the recklessness of price cutters digging a pit for themselves that others would stay out of.

There will be differences, of course, between plants and companies, between crudes and locations, and in many other factors, but a definite effort by an experienced committee to arrive at the basic costs of manufacturing gasoline, the actual expense involved in the manufacturing process, should be possible and profitable to the entire industry.

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DRESSER
COUPLINGS DOMINATE

PAPERS OF INTEREST TO MARK DALLAS MEETING OF ENGINEERS

By Thomas F. Smiley

Discussions of value to practical workers in the oil industry are expected to characterize the spring meeting of the Texas-Louisiana-Arkansas district, American Petroleum Institute Division of Development and Production Engineering to be held Wednesday and Thursday, April 3 and 4, in the Baker Hotel, Dallas, Tex. Increasing evidences of interest in the meeting leads E. O. Bennett, Fort Worth, Tex., district chairman, to look for an attendance close to 300 of production men from the three States making up the district. Engineers, production superintendents and foremen, and field men of all kinds will be benefited, it is pointed out. As the sessions are open to the general public and as the subjects for discussion are of unusually live interest, it is predicted that many persons not members of the organization will take advantage of the opportunity offered.

Commenting on the Dallas meeting, C. A. Young, executive secretary of the A.P.I. Division of Development and Production Engineering, said these district meetings were especially important for the working out of local problems. "Oil companies should send their field men to listen to the papers presented and to take part in the discussion," said Mr. Young. "The greatest value of these district meetings comes from the discussion that follows the papers."

Practical Problems to Get Attention

W. H. Meier, chairman of the program committee, has worked hard to make the Dallas meeting as interesting and constructive as possible, and the subjects of papers announced show that practical field problems will hold the attention of those who attend.

"Penalty of Crooked Holes," "Overcoming Crooked Holes," and "Oilwell Cementing Problems," are on the program for the forenoon of the opening day, with discussions following each paper. It is believed that discussion of the papers on crooked holes will be especially lively and instructive as no other subject in the whole field of oil production has aroused more interest in recent months.

The subjects for the afternoon session are "Maintaining Pressure and Repressuring During Early Stages of Development," "Effect of Choking Wells in the Winkler Pool," and "Value and Importance of Field Records."

A business session is on the program for Thursday morning, the principal business being the election of district chairman, vice chairman and secretary for the forthcoming year. Suggestions for these offices are being mailed to the nominating committee, of which W. D. Brookover, of Wichita Falls, Tex., is chairman.

Special Committees to Report

Interest attaches to reports of special committees prepared for presentation at the spring meeting. These include reports on "Winkler County Pumping Equipment," Joseph Holmes, chairman; and, "Standardization of Screen Pipe Openings," M. Manning, chairman. The committee on Screen Pipe Openings made one report which was referred to the A.P.I. committee on Standardization of Pumping Equipment. The A.P.I. committee referred additional questions back to Mr. Manning's committee, and these questions were to be reported on at the Dallas meeting.

The report of standing committees include those on "Drilling Practice," Melbert Schwarz, chairman; and "Production Practice," W. W. Scott, chairman. Discussion is to follow each of the reports.

The Dallas Wildcat Committee of the Mid-Continent Oil and Gas Association is in charge of the entertainment program, which embraces features insuring a good time for all the visitors.

High Spots in Field News

KANSAS

Test in center of Sedgwick County activity has hole full of water.

SOUTHWEST TEXAS

Joe Bruner Field reaches 33,650 bbls. with well flowing 4,500 bbls. Field can go to 50,000 bbls. or more.

MICHIGAN

Nine new producers with a combined initial flow of 7,000 bbls. gave week high record in Muskegon and Laketon Townships.

NORTH LOUISIANA-ARKANSAS

Possibility of another small pool in Caddo Parish.

Well quarter mile south of new Arkansas Pool, in Ouachita County, made two heads of 30 bbls. each.

GULF COAST

Production at Dewalt, Fort Bend County, extended 500 feet north by Humble Co. well flowing 1,500 bbls.

Federal Oil Co. well at Old Hackberry flowed 1,500 bbls.

ROCKY MOUNTAIN AREA

Jal district has 20,000,000-foot gasser.

Idaho is attracting some attention through wells in eastern area near Wyoming line.

Show of oil in Wayne County, Utah.

CALIFORNIA

Universal Consolidated and Shell Corp. get two good wells from deep horizon at Santa Fe Springs. O'Connell zone proves highly prolific. Tests for deeper production in prospect.

TEXAS PANHANDLE

Semiwildcat in Gray County starts flowing 103 bbls. an hour but drops to 1,055 bbls. due to paraffin trouble.

Bowers Pool flush producer makes 3,500 bbls. of 41 gravity oil.

WEST TEXAS

Engineering committee recommends 7,500 bbl. reduction in Roberts Pool, southern Howard County, bringing production down to 37,500 bbls. from lime producing wells.

Advisory committee in Winkler County recommends reducing production 25,000 bbls. to prevent water encroachment.

OKLAHOMA

Through proration and Sunday shut down output of state dropped below the prescribed 650,000 bbls. Flush fields produced 297,814 bbls. Monday morning, making state output 597,814 bbls. for one day.

East of Earlsboro Magnolia Co.'s No. 1 Anderson swabbed 600 bbls. and no water and under agreement will be pumped 50 bbls. daily.

I. T. I. O. Co.'s No. 1 Foster, Oklahoma City area, found 2,000 feet of salt water.

Four failures in North St. Louis pool lessen possibility of additional Wilcox sand production there.

Late News from the Field

OKLAHOMA

Owing to the combined effects of both proration of oil runs and the Sunday shut-down policy, the output of the entire State of Oklahoma dropped below the prescribed figure of 650,000 bbls. one day this week. The flush fields of the State produced 297,814 bbls. on Monday morning (Sunday's production) and with the remainder of the fields of the State making about 300,000 bbls., this placed the one day's output at 597,814 bbls. for one day. It has been many moons since the Oklahoma Fields have produced so little oil for one day. The ordinary figures for the flush fields have been averaging about 366,307 bbls. The production of the pools of the Greater Seminole and St. Louis regions for two days follows:

Pool—	Sunday a.m. (bbls.)	Monday a.m. (bbls.)
Little River	73,609	61,336
Carr City	9,457	4,526
Maud	17,684	17,725
Mission	25,908	24,439
Bowlegs	34,994	23,085
Earlsboro	60,040	41,304
Seminole	32,000	24,081
Searight	10,523	8,707
Total Seminole	264,221	205,203
St. Louis	102,086	92,611
Total flush fields	366,307	297,814

In the north end of the St. Louis Pool, the Sinclair Oil & Gas Co.'s No. 3 Nesbitt, NW cor. NE NW Section 18-7-5, started flowing naturally at the rate of 250 bbls. an hour. This well had the Wilcox sand higher than most of the wells in the region which have been disappointing. The Wilcox sand in the Nesbitt well was found 4,109-23 feet, and the well produced 5,610 bbls. during the first 24 hours.

In the Carr City area, the Barnsdall Oil Co.'s No. 5 Coker, NW cor. NE SW Section 11-8-5, has a hole full of oil in Wilcox sand 4,362-72 feet, and is drilling deeper. In the same area, the Empire Oil & Refining Co.'s No. 2 Cluck, NW cor. SE Section 11-8-5, flowed 260 bbls. daily on air lift from Wilcox sand found 4,142-52 feet.

In the Maud area, the Laurel Oil & Gas Co.'s No. 3 Billington, SW cor. NE NW Section 18-8-5, made one flow from the Misener sand found 4,115-27 feet, and is drilling at 4,137 feet.

To the east of the Earlsboro Pool, the recently discovered well of the Magnolia Petroleum Co. swabbed 600 bbls. of oil and no water in 24 hours. This is No. 1 Anderson, NE cor. SW Section 18-9-6, and under an operators' agreement the well will be pumped at the rate of 50 bbls. daily.

In the Oklahoma City area there is another failure in the upper sand. The Indian Territory Illuminating Oil Co.'s No. 1 Foster, C NE SW Section 24-11-3w, cemented the 9-inch casing at 4,907 feet. The 7-inch pipe was run at 5,031 feet, with four perforated joints at the bottom. This well had a good core taken at this depth, but when the hole was bailed out, 2,000 feet of salt water was found.

GULF COAST

HOUSTON, Tex., Mar. 26.—Production at Dewalt, Fort Bend County, was extended 500 feet north Tuesday when Humble Oil & Refining Co.'s No. 5 Sugarland was completed flowing 1,500 bbls. pipe line oil daily from sand at 3,745 feet. At Old Hackberry, Cameron Parish, Louisiana, Federal Oil Co.'s No. 1 Duhon came in Monday flowing 1,500 bbls. daily at 3,272 feet. Federal Oil Co.'s No. 3 Kaough is flowing by heads 50 bbls. daily. At Spindletop, Jefferson County, Yount Lee Oil Co.'s No. 83 Gladys City was completed flowing 800 bbls. daily at approximately 3,125 feet.

NORTH LOUISIANA-ARKANSAS

SHREVEPORT, La., Mar. 26.—Possibilities of another small pool in North Caddo Parish were opened Sunday by D. C. R. Oil Co.'s No. 1 Hunter estate in Section 17-19-14, 5 miles southwest of the nearest production and 12 miles north of Shreveport. On a drill stem test of 2 feet of sand at 2,412-14 feet it filled 20 fourbles of pipe with 39 gravity oil in 40 minutes and is shut down waiting for casing. Total depth is 2,422 feet with sandy shale from 2,390 feet.

McDonald Brothers' No. 1 Wilson, Section 25-15-18, Ouachita County, a quarter mile south of the discovery well in the new Arkansas Pool, set liner at 2,854 feet, drilled 4 feet deeper through sand and made two heads Sunday of about 30 bbls. each and is standing 300 feet from the top in oil.

RECOMMEND 25,000-BBL. CUT IN WINKLER COUNTY

FORT WORTH, Tex., Mar. 26.—Winkler County Advisory Committee meeting in Fort Worth today voted to recommend to the Texas Railroad Commission a 25,000-bbl. cut in allowed runs in Hendricks, bringing production down to 150,000 bbls. The commission will hold a hearing relative to the proposed cut the latter part of this week. Operators hope to have the reduction effective April 1.

Gulf Pipe Line Co. has ordered pipe for a 136-mile loop for its 10-inch West Texas main line and by the addition of more pump stations the capacity will be increased to 50,000 bbls. daily. The line originates at Midland and connects with a main line system running south to the coast in central Texas. Pipe is expected to be rolling April 1 and completion is scheduled for September 1.

Gray County Semiwildcat Is Feature

Started Flowing at Rate of 103 Bbls. Hourly but Down to 1,055 Owing to Paraffin Trouble. Good Panhandle Producers

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Mar. 25.—A semiwildcat in Gray County, along with other big flush producers in the Panhandle, overshadowed the developments in other areas of North Texas during the week. Marland Oil Co.'s No. 1 Finley-Brown, NE cor. Section 32, Block B-2, H.&G.N. Survey, 2 miles west of Lefors, was the outstanding development in Panhandle. The well started off flowing 103 bbls. hourly from granite wash pay at 2,843-45 feet but because of paraffin trouble production is down to 1,055 bbls. daily.

In the event the well can be freed of paraffin trouble production is expected easily to double the present output. The oil tested 42.4 gravity and the well is located in semiwildcat territory approximately half way between production in the Lefors area on the east and production in the Bowers Pool on the west. First gas was encountered at 2,455 feet, more at 2,550 feet, and an estimated flow of 70,000,000 feet at 2,785 to 2,815 feet. After blowing four days the gas flow was measured and the well gauged 46,000,000 feet of gas.

The best flush producer of the week was in the Bowers Pool when Oil Operators Oil Co.'s No. 3 Jackson was completed as a 3,500-bbl. flush producer in granite wash at 2,840-45 feet. The oil tested 41 gravity. Champlin Refining Co.'s No. 2 McConnell, NE cor. W half NW Section 67, Block 4, Carson County, has probably found a new producing zone in that district. The well made 580 bbls. on a swab test from pay at 3,118-23 feet. No. 1 on this lease is an old producer making around 100 bbls. but producing from a higher zone.

Down in the Chapman area, southeast of Lefors, Shamrock Oil Co. completed a 1,000-bbl. initial producer at 2,812-24 feet. This area was discovered by a well that made more than 4,000 bbls. initially, but production fell off rapidly due to paraffin trouble and subsequent wells have not yielded nearly as much flush production.

Deepened to Oil Pay

The Texas Company's No. 1 Williams, NW cor. Section 7, Block 1, A.C.H.&B. Survey, which was completed some time ago as a gas well, was deepened to oil pay last week. The total depth of the hole is 2,665 feet and the well started off making 550 bbls. daily. Two completions were reported in Hutchinson County, one a small oil producer and the other a gas well. Another big gas well was added to the Shamrock area when Edwards and associates' No. 2 Trostle, Section 130, Block 23, Wheeler County, was completed making 45,000,000 feet of gas.

Production in Panhandle increased 1,895 bbls. over the daily average estimate of the previous week. Gray and Moore Counties were the only two registering increases while the others were lagging. Gray County's increase was due to new flush production while the lowering of pipe in Skelly Oil Co. wells in the Armstrong Pool of Moore County accounted for the increase in the northwest producing area.

Roeser & Pendleton and Marland company's No. 2-A-88 Cook, 2,461 feet from the north line and 1,950 feet from the west line of Section 88, E.T.R.R. Survey, Shackelford County, has extended the Cook Ranch Pool about a mile to the west. The well is estimated to be making 12,000,000 feet of gas and spraying 260 bbls. of oil from sand at 1,400-13 feet. This area will probably be drilled to define it but production will be restricted awaiting better market conditions.

Ranger and Wichita Areas

The extension well was the principal development in the Ranger district. Production remains about constant with the fluctuations in the various counties gaining sufficient to offset the natural decline. Brown County has been showing the most consistent decline while Shackelford County has been on a gradual increase for several weeks.

Although activity in the Wichita Falls district has about reached its normal state after being way below normal for several weeks due to a water shortage, no significant field developments were reported. Several slight extensions were made in the older area but new drilling in the newer territories is barely under way and the stories to be told from those wells are still in the offing.

Production of the district showed little change compared with the estimates of the previous week. Wilbarger County went back into the lead as the State's leading light oil producing county when it barely nosed Wichita County from the berth. Cooke County continues to make healthy climbs in daily average production due to the good flush production in the Bulcher Pool.

Estimated Daily Average Production
NORTH TEXAS
Week ending March 23

Panhandle district—	Bbls.
Carson County	5,895
Gray County	23,810
Hutchinson County	26,060
Moore County	1,485
Potter County	20
Wheeler County	575
Total this week	57,845
Total last week	55,950
Increase	1,895
Wichita Falls district—	
Archer County	16,575
Baylor County	80
Clay County	388
Cooke County	4,300
Jack County	1,536
Montague County	6,999
Throckmorton County	605
Wilbarger County	27,596
Young County	6,936
Wichita County	27,570
Total this week	92,585
Total last week	92,664
Decrease	79
Ranger district—	
Brown County	8,731
Callahan County	3,720
Coleman County	3,652
Comanche County	1,096
Palo Pinto County	377
Ranger	5,697
Shackelford County	13,297
Stephens County	6,776
Total this week	43,354
Total last week	43,163
Increase	191
Grand total this week	193,784
Grand total last week	191,777
Increase	2,007

WICHITA COMPLETIONS

Week Ended March 23

Archer County

C. E. McCutchen, trustee, No. 10 Perkins made 10 bbls. at 1,012-31 feet. Shappell Oil Co.'s No. 43 Jackson made 35 bbls. at 1,793-98 feet. The Texas Company's No. 3 Parkey was dry and abandoned at 1,750 feet. C. W. Beasley's No. 2 Abercrombie & Taylor was dry and abandoned at 1,405 feet. Beavers and others' No. 1 Benson was dry and abandoned at 880 feet. Humble Oil & Refining Co.'s No. 1 Turbeville-A was dry and abandoned at 1,138 feet. King-Looney and others' No. 1 Hudson was dry and abandoned at 1,450 feet. C. B. Long's No. 1 Taber was dry and abandoned at 1,514 feet. Magnolia Petroleum Corp.'s No. 1 Llewelyn and others was dry and abandoned at 2,014 feet. Prairie Oil & Gas Co.'s No. 1 Benson made 31 bbls. at 834-46 feet.

Clay County

Mid-Continent Holding Co.'s No. 2 Stine and others made 35 bbls. at 1,759-80 feet. Its No. 4 Stine and others was dry and abandoned at 305 feet.

Cooke County

C. M. Beckner and others' No. 1 Grotte was dry and abandoned at 1,614 feet. Kewanee Oil & Gas Co.'s No. 8 Timis-A made 92 bbls. at 1,113-1,261 feet. Superior Oil Corp.'s No. 1 Rudd was dry and abandoned at 2,523 feet.

Jack County

Lindsey Drilling Co. and others' No. 1 Thomason made 2,000,000 feet of gas at 2,850-95 feet and was drilled to a total depth of 3,527 feet. Osage & Vacuum Oil Co.'s No. 1 Clayton was dry and abandoned at 3,315 feet.

Montague County

Bridwell Oil Co.'s No. 9 Salmon-A made 8 bbls. 1,240-48 feet.

Wichita County

Atlantic and others' No. 1 Barton-B was dry and abandoned at 1,801 feet. Bullington Lee and others' No. 9 Jennings made 12 bbls. at 1,523-50 feet. J. A. Fisher's No. 6 fee made 12 bbls. at 1,601-09 feet. Howell & Somers' No. 1 Hirschi was dry and abandoned at 5,283 feet after having an oil show at 3,174-76 feet. Humble Oil & Refining Co.'s No. 16 Taylor made 60 bbls. at 1,477-87 feet. Magnolia Petroleum Corp.'s No. 141 Reilly made 50 bbls. at 1,622-27 feet. W. B. Omohundro's No. 21 Pace made 18 bbls. at 1,773-83 feet. Panhandle & Venmex's No. 6 Burnett was dry and abandoned at 2,000½ feet. Producers Drilling Co.'s No. 1 Allen-Kemp made 40 bbls. at 1,633-48 feet. Red River Oil Co.'s No. 31 Bywaters was dry and abandoned at 2,150 feet. Ryan Petroleum Corp.'s No. 107 Nance made 50 bbls., 50 per cent water at 1,805-06 feet. The Texas Company's No. 13 Allen & Kemp made 33 bbls. at 1,633-44 feet.

Wilbarger County

Baker and others' No. 11 Waggoner-B made 60 bbls. at 1,883-1,900 feet. Barkley & Meadows' No. 6 Waggoner-A was temporarily abandoned at 2,464 feet. Lewis Production Co.'s No. 4 Waggoner made 18 bbls. after having been drilled to a total depth of 2,470 feet, plugged back to 2,460 feet, finding an oil show at 2,380-84 feet.

Young County

Bradstreet Co.'s No. 6 Snider made 25 bbls. at 559-66 feet. Brashear & Peacock's No. 1 Gregg made 20 bbls. at 585-97 feet. Bratcher's No. 4 Edwards made 20 bbls. at 453-504 feet. Johnston's No. 2 Garvey was dry and abandoned at 899 feet. Carker and others' No. 1 Carpenter was dry and abandoned at 603 feet. Stafford and others' No. 1 Melton was dry and abandoned at 545 feet. Steed & Gans' No. 13 Snider was dry and abandoned at 600 feet. Nash & Windfohr's No. 3 Ware-A made 50 bbls. at 2,132-68 feet.

RANGER COMPLETIONS

Week Ended March 23

Brown County

Community Gas Co.'s No. 1 Baugh was dry and abandoned at 912 feet. Cranfill & Reynolds' No. 1 Marr-B was dry and abandoned at 1,303 feet. Mook-Texas & Wakefield's No. 6 Newton made 10 bbls. after having been shot with 40 quarts at 1,343-63½ feet. Phillips Petroleum Corp.'s No. 3 De Busk was dry and abandoned at 1,530 feet. Glenn & McLaughlin's No. 1 Dixon was dry and abandoned at 1,518 feet.

Callahan County

Newman & Hill's No. 1 Powell location was abandoned. The Texas Company's No. 1 Bush was dry and abadoned at 2,345 feet.

Coleman County

White Eagle Oil & Refining Co.'s No. 1 Eddington was dry and abandoned at 1,700 feet. Zoch and others' No. 1 White was dry and abandoned at 2,510 feet. J. R. Foster's No. 1 Overall was dry and abandoned at 2,401 feet. Watchorn Oil Co.'s No. 1 Vandeford was dry and abandoned at 2,847 feet.

Erath County

Hickory Oil & Gas Co.'s No. 1 Gordon was dry and abandoned at 3,715 feet. Walker and others' No. 1 Fulfer was drilled to a total depth of 3,505 feet,

(Continued on Page 154)

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week ended March 23

Company, well, farm, name, section and block—	Remarks—
CARSON COUNTY	
Delmar Oil Co.'s No. 3 Noel, 330 ft. from E line and 990 ft. from N line W½ SE, Sec. 198, Blk. 3	C.O. 3,090 ft.
Gulf Prod. Co.'s No. 1-E Cooper, 330 ft. S and W of NE cor. SW, Sec. 5, Blk. 9, I.&G.N. Sur.	Drlg. 2,410 ft.
Gulf Prod. Co.'s No. 6 Noel, 330 ft. S and 1,320 ft. E of NW cor. of SW Sec. 198, Blk. 3, I.&G.N.	Drlg. 2,095 ft.
Marland Prod. Co.'s No. 1 Burnett-L, 440 ft. S and 1,320 ft. NW of NE cor. Sec. 79, Blk. 4, I.&G.N. Sur.	Spud.
McElroy Oil Co.'s No. 1 Lewis, 330 ft. S and E of NW cor. of SW of NE, Sec. 115, Blk. 4, I.&G.N.R.R. Sur.	Spud.
Morris et al's No. 1 Barnard, NW cor. SW SE, Sec. 44	S.D. 2,210 ft.
Spartan Oil Co.'s No. 1 S. Bednorz, NW cor. E½ NW, Sec. 202, Blk. 3, I.&G.N. Sur.	Set 6-in. 2,658 ft. and fishing.
Skelly Oil Co.'s No. 1 Hedrick, 660 ft. from N line and 660 ft. from W. line Sec. 239, Blk. B-2, H.&G.N. R.R. Sur.	Drlg. 1,780 ft.
Skelly Oil Co.'s No. 12 Schaffer, 330 ft. from S line and 1,650 ft. from the W line of Sec. 88, Blk. 4, I.&G.N.R.R. Sur.	355 bbls. 3,170-77 ft.
Travis et al's No. 1 D. A. Harrell, C NE NE, Sec. 162, Blk. 7, I.&G.N. Sur.	S.D. 3,261 ft.
Ware et al's No. 1 Ware, 990 ft. S and 460 ft. E NW cor. Sec. 18, Blk. 1, A.B.&M. Sur.	S.D. 4,365 ft.
CASTRO COUNTY	
Colorado O. & R. Co.'s No. 1 M. Siemmons, SW cor. Sec. 75, Blk. M-17, B.S.&F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE, Sec. 333, Blk. M-6, S.K.&K. Sur.	S.D. 510 ft. for csg.
CHILDRESS COUNTY	
C. L. Soane et al's No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	S.D. 4,340 ft.
The Texas Co.'s No. 1 Smith, 100 ft. each way from NW cor. Sec. 174, Blk. H., W.&N.W. Sur.	Hole full sulphur wtr. 3,985 ft; fish. bailer 4,450 ft.
COCHRAN COUNTY	
Marland Prod. Co.'s No. 1 Slaughter-A, 330 ft. from W and 430 ft. from S lines, League 130, Carson County School Land	Spudding.

(Continued on Page 106)

Winkler County Only Threatening Area

Potentially Flush Districts in North and South Might Be Developed as Hendricks Passes Out of the Picture

By James H. Dameron
Staff Correspondent, West Texas Fields

FORT WORTH, Tex., Mar. 25.—With only a few interesting developments in the field most of the interest in West Texas was centered upon the efforts of operators to further throttle production in flush areas to conserve the life of those pools and incidentally help bring West Texas back down to its daily average 1928 production.

Following an engineering committee report on water encroachment in the Roberts Pool of southern Howard County the new advisory committee holding its first meeting last week recommended a 7,500-bbl. cut in runs effective April 1. This will bring production of that county down to 37,500 bbls. from the lime producing wells. Considering those wells governed by proration that can not make their quota the production of the county will not be much over that figure because the sand production will not much more than offset that loss.

Of more importance are the plans of the advisory committee of the Winkler County plan to slash 50,000 bbls. daily from the allowed production of Hendricks. At present Winkler County is allowed to produce 175,000 bbls. daily. Several weeks ago E. A. Landreth, former chairman of the committee, attempted to prevail upon the Winkler County producers the necessity of cutting runs.

Water encroachment in the county is the primary reason for the sponsors of the reduction plan requesting another cut in runs. Opinion is divided to some extent on the wisdom of further pinching wells and examples supporting the arguments of both sides can be supplied. However, it seems that the majority is of the opinion that another cut is necessary to better conserve the field.

Considering Curtailment

Some of the best authorities in the field are of the opinion that if runs are not reduced in the near future nature will take a hand and make further proration in the Hendricks Pool unnecessary. When the cut was proposed several weeks ago to permit a greater back pressure to be applied to the flowing wells many were favorable to a still greater cut. At that time there was sufficient opposition to the plan to make it impracticable to attempt its adoption.

The Advisory Committee will meet Tuesday morning in the offices of P. W. Woodruff, vice president of the Southern Crude Oil Purchasing Co., temporary chairman of the committee, and will discuss the proposal. In the event Winkler County runs are slashed 50,000 bbls. the prospects of West Texas production being brought down to around 300,000 bbls. daily by early summer appear bright. Still another cut may be made in southern Howard County, although it would be small.

Winkler County appears to be the only threatening area in West Texas at present where competitive drilling might easily be brought about. The other areas that could be a menace are either controlled by proration or the acreage is controlled by companies with no desire to carry on an accelerated drilling campaign. Many are of the opinion that northern and southern Winkler County are potentially flush areas and may be developed as such about the time Hendricks passes out of the picture as a threat. On north across the State line into Lea County, New Mexico, is a different story.

Pipe Line Extensions

In the meantime transporters are preparing to handle a larger volume of crude. Gulf Pipe Line Co. is nearing completion on the extension of its line from Midland tank farm to the Hendricks Pool and the Magnolia Pipe Line Co. will finish its extension from Midland to the same point a short while later. Atlantic Pipe Line Co. is reported planning extension of its line into Ward County to purchase oil in the Shipley area. Fifteen cars of 6-inch pipe have been unloaded at the company's farm at Midland.

Completion of these lines, however, will not increase the true outlet of West Texas because they all tie into main line systems built some time ago. Shell Pipe Line Corp. is nearing completion on its coastal outlet carrier which starts at McCamey and terminates at Houston. The Humble Pipe Line Co. is increasing the capacity of its line running east to connect with a main coastal system in central Texas. Texas Pipe Line Co. is building the first line into Lea County, New Mexico, but at present the widely scattered production of the county has not reached alarming proportions.

Transporters are running their lines almost to capacity at present and runs to steel storage showed a sharp drop during the second week in March, according to estimates made on disposition of West Texas crude for that period. With increases in pipe line runs and tank shipments, runs to storage were reduced to 17,480 bbls. daily. This is the least amount of oil sent to steel storage in West Texas for any weekly period within the past six months.

This figure will probably be shaved again during the next period because the Cosden & Co. refinery at Big Spring started up March 22 and is running around 6,000 bbls. daily. Coupled with the reduction of allowed production in West Texas this will probably keep the runs to storage at a low figure. Throughout the winter runs to storage in West Texas did not reach alarming proportions except once and the following week they were reduced by increased shipments. The following is a comparative summary of crude movements in West Texas:

WEST TEXAS PIPE LINE RUNS
March 7 to 13 (Inclusive)
Runs Through Trunk Lines

	Last period
Atlantic P. L. Co. to Port Arthur	32,664
Gulf P. L. Co. to Coast via Ranger	24,714
Humble P. L. Co. via Comyn	38,609
Humble P. L. Co. via Ingleside	50,246
Illinois P. L. Co. via Del Rio	44,000
Magnolia P. L. Co. to Coast Via De Leon	31,742
Pasotex P. L. Co. to El Paso	12,647
Shell P. L. Co. to Healdton (Okla.)	38,679
Total	273,301
Tank Car Shipments	
Thomas & Brann, Grant City	480
Orient, McCamey	150
The Texas Company, Crossett	296
American Pet. Co., Pyote	9,477
Cosden & Co., Big Spring	8,177
Shell Pet. Co., Monahans	2,042
Skelly Oil Co., Pecos	3,445
Southern Crude O. P. Co., Wickett	14,921
The Texas Company, Monahans	323
Burford Refining Co., Pecos	1,120
Total	40,432
Runs to West Texas Refineries	
Amarillo Prod. Co., Pyote	2,467
Blue Bonnett Refining Co., Wickett	4,975
Burford Refining Co., Pecos	2,061
Col-Tex Ref. Co., Colorado	6,500
Great Western Ref. Co., Big Spring	3,027
Humble Oil & Ref. Co., McCamey	9,256
Midland Refining Co., Midland	1,614
Tonkawa Refining Co., Pyote	4,467
Valley Refining Co., Pyote	5,161
Big Spring Ref. Co., Big Spring	1,827
Total	41,349

Summary

	Previous week	Last period
Pipe line runs	272,158	273,301
Tank car shipments	35,760	40,432
Runs to W. Texas refineries	44,424	41,349
Total daily disposition	352,342	355,082
Daily average production	389,684	372,562
Daily average to storage	37,342	17,480

Estimated Daily Average Production
WEST TEXAS
Week ending March 23

County—	Wells	Prodn.
Crane County	279	36,228
Crockett County	45	2,221
Ector County	2	9
Fisher County	7	954
Glasscock County	17	909
Howard County	290	45,643
Jones County	76	6,165
Loving County	10	654
Mitchell County	142	2,551
Pecos County	293	86,659
Reagan County	240	18,495
Runnels County	3	135
Scurry County	5	31
Upton County	265	13,365
Ward County	3	169
Winkler County	571	168,421
Total this week	2,248	382,600
Total last week	2,228	385,640
Difference	20	3,040

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended March 23

ANDREWS COUNTY

Company, farm and location— Remarks—

Deep Rock Oil Co.'s No. 1 Hostetler, 2,310 ft. N and W of SE cor. Sec. 20, Blk. A-46 ..... Hole full water 1,390 ft.; underreaming 10-in. casing; top salt 1,890 ft.; set 8¼-in. casing 2,790 ft.; no gas; drlg. 3,645 ft.

Mid-Continent Oil & Gas Co.'s No. 1 Fisher, 1,320 ft. N and 200 ft. E of SW cor. Sec. 5, Blk. A-36 ..... Spudding 85 ft.

BORDEN COUNTY

Gibson & Johnson's No. 1 Higginbotham, middle of S line of Sec. 8, Blk. 21, Twp. 3n, T.&P.R.R. Sur. ..... Rigging up.

C. E. Hyde et al's No. 1 D. H. Beal, C NE Sec. 14, Blk. 21, Twp. 3n, T.&P.R.R. Sur. ..... Set 15-in. casing 700 ft.

Teas & Wheeler's No. 1 Long, 1,320 ft. N and E of Sec. 27, Blk. 30, T.&P. Sur. ..... Location.

BREWSTER COUNTY

E. W. Bateman et al's No. 1 Nevill, 2,000 ft. from S line and 1,000 ft. from W line of Sec. 64, Blk. 13, G.H.& S.A.R.R. Sur. ..... Cleaning out 1,955 ft.

Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. ..... Drlg. 1,115 ft.

Cowden & Bowser's No. 1-A Jackson & Harmon, Sec. 1, Blk. 331, T.C.R.R. Sur. ..... Set 8-in. 1,530 ft.; shut down 2,000 ft.

Forrest Oil Co.'s No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur. ..... Drlg. 1,475 ft.

J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G.H.&S.A. Sur. ..... Shut down 1,150 ft.

Johnson & Weekly's No. 1 Jackson & Harmon, C Sec. 104, Blk. 10, G.K.&S.A. Sur. ..... Drlg. 285 ft.

Van Mo hall's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine ..... Shut down 1,740 ft.

Williams and others' No. 1 Poncey, 459 ft. S and 1,062 ft. E Sec. 26, Blk. 214, T.&St.L.R.R. Co. ..... Shut down 515 ft.

COKE COUNTY

Cates & Dennis' No. 1 Mimms, 2,500 ft. S and 330 ft. E of NW cor. Sec. 47, Blk. 4, T.&P. Sur. ..... Shut down 1,585 ft.

Cates & Dennis' No. 2 Mimms, 2,340 ft. N and W SE cor. Sec. 8, Blk. W, T.&P. Sur. ..... Spudded and shut down.

Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H.&T.C. Sur., elev. 2,750 ft. ..... Shut down 2,860 ft.

Mid-Kansas Oil Co.'s No. 1 W. E. Lackey, 330 ft. N and E of SW cor. Sec. 272, Blk. 1-A, H.&T.C. ..... Drlg. 3,295 ft.

CONCHO COUNTY

Duffey & Silk's No. 1 Lovelace and Lockett, 1,050 ft. N and 640 ft. W of SE cor. Sec. 66, Blk. 70, H.&T.C. Sur. ..... Drlg. 1,035 ft.

Exploration Co.'s No. 2 Hartgrove, 900 ft. S and 985 ft. E of NW cor. Johann Scheuch Sur. No. 240 ..... Rig.

Lloyd Jones Co.'s No. 1 Jones, 420 ft. S and 15 ft. E of NW cor. John G. Reh Sur. No. 1,878 ..... Shut down 150 ft.

CRANE COUNTY

Gulf Prod. Co.'s No. 6 Waddell, C NW NE Sec. 12, Blk. B-25 ..... Top salt 1,825 ft.; show oil and gas 3,275-85 ft.; shut down 3,480 ft.; 1,200 ft. oil in hole.

CROCKETT COUNTY

Eppenaur et al's No. 2 Noelke, 500 ft. N and 1,250 ft. E of SE cor. Sec. 64, Blk. 1, I.&G.N.R.R. Sur. ..... Spudded and shut down.

Lewis & Daniels' No. 1 Pecos River Bed, 19 yards S and 37 degrees E of NW cor. Sec. 33, Blk. 1, I.&G.N. Sur. ..... Drlg. 610 ft.

W. W. Donnelly & Young's No. 1 Shannon, SW SW SE Sec. 42, Blk. BB, T.C.R.A. Sur. ..... Drlg. 542 ft.

(Continued on Page 101)

WEST TEXAS COMPLETIONS

Week Ended March 23

Crane County

Gulf Production Co.'s No. 60 McElroy, 330 feet from south and east lines of Section 205, Block F, had an initial production of 240 bbls. at 2,806-2,905 feet.

Fisher County

Sun Oil Co. and Cranfill & Reynolds' No. 1 Brown, Section 4, Block R, had an initial production of 50 bbls. at 3,193-96 feet.

Howard County

Group One-Marland Oil Co.'s No. 5 Settles, 2,310 feet from north and 330 feet from west line of Section 133, Block 29, had an initial production of 250 bbls. at 2,202-27 feet. Their No. 6 Settles, 2,310 feet from south and 330 feet from west line of Section 33, Block 29, had an initial production of 116 bbls. in 14 hours at 2,170-2,220 feet. Laurel & Cosden Co.'s No. 10 Dora Roberts made 66 bbls. hourly at 2,965-75 feet. Marland Oil Co.'s No. 7 Clay, 990 feet from north and east lines of Section 155, Block 29, W.& N.W.R.R. Survey, had an initial production of 130 bbls. at 1,828-51 feet. Schermerhorn Oil Co.'s No. 4 Roberts-A, located 2,270 feet from north and 2,256 feet from east line of Section 137, Block 29, topped the pay at 2,954 feet, was drilled to a total depth of 2,983 feet and had an initial production of 35 bbls. hourly.

Irion County

Fuhrman's No. 1 Suggs, Lease No. 3, in the C SE of Section 3,009, Block 24, made three bailers sulphur water per hour at 2,275 feet.

Menard County

Carl Cromwell's No. 1 Wilhelm, in the C NE of Section 6, was dry and abandoned at 3,150 feet.

Nolan County

C. M. Root's No. 1 Simpson, 330 feet from north and east of SE of Section 33,

(Continued on Page 152)

Cracking profitable gas oil into profitless fuel oil is converting available profits into avoidable losses

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Four Failures in North St. Louis Pool

Possibility of Additional Wilcox Sand Production There Lessened. Crude Oil Situation Seems Somewhat Improved

By J. L. Dwyer

One effect of the sale of the T. B. Slick properties to the Prairie Oil & Gas Co. has been to strengthen the Oklahoma crude oil market. The Slick interests controlled about 35,000 bbls. of oil daily, and this quantity of crude will be removed from the ever dwindling "free" oil column. The Prairie has already served notice upon several crude oil purchasing companies which were connected to the various Slick properties that in a few days they will have the Prairie Pipe Line Co. connected to the leases, and will purchase the oil themselves.

A more optimistic note prevails through the removal of this free oil from the open market, although there is still considerable oil going into storage daily in the Oklahoma-Kansas region. The distribution of the oil entering storage has been changed slightly by the new alignment, but there has been no real improvement in the situation. There is still an abundance of oil being produced in the Oklahoma-Kansas territory, and were it not for the limitations brought about in production through the workings of the proration agreement, the market would be extremely soft.

In the matter of activity, the fields are rather quiet, and the larger companies have evidently stopped the purchase of protection acreage around all wildcat drilling operations. This policy has assisted greatly in reducing the number of new wildcat operations which have been reported during the past few weeks.

In the flush fields of the State, the shutting down of wells for eight or twelve days upon top of the sand has also been felt, and it has slowed up the bringing in of new production. In this one phase of proration, all companies seem to have heartily co-operated.

North St. Louis Failures

On the north side of the St. Louis Pool, the possibilities of discovering additional Wilcox sand production have been lessened by the failure of four wells which were within striking distance of production. The wells were reasonably close to the Slick and Maud Oil & Gas Co.'s Davis well in Section 18-7-5, which started flowing 5,000 bbls. daily from the Wilcox sand, and which later began cutting very heavily. Out of the crop of wells started around the Slick-Maud Davis well, the Magnolia Petroleum Co.'s No. 3 Brandenburg, SE cor. NW NW Section 18-7-5, is the only one which looks like a fair producer, the others being failures. The Brandenburg well swabbed 215 bbls. in 18 hours from the Simpson sand, although the Wilcox horizon was found dry from 4,282-88 feet.

On the west side of the St. Louis Pool, the Gypsy Oil Co.'s No. 1 Roseman, center N half, NW NE Section 26-7-4, has extended the production of that region two locations west. This well had the Wilcox sand 4,588-4,624 feet, and is flowing 1,578 bbls. of oil daily on air, and is cutting 2 per cent. It seems fairly well accepted that while this well has caused an extension, it is an edge well, and will mean little as far as any change in the general outlook for St. Louis is concerned.

The pipe line situation at St. Louis keeps reasonably close to production. The daily average pipe line runs for the week ending Saturday, March 23, follow:

	Bbls.
Consolidated	2,250
Gulf	8,891
Independent	6,131
Magnolia	28,583
Oklahoma	6,711
Prairie Pipe	15,672
Shell	1,560
Sinclair	23,657
Texas	3,813
Tidal	2,200
Total	99,468

Seminole Area Quiet

The shut-down on top of the sand in the Seminole area has kept the appearance of that field very quiet. The most interesting spot at this time is around the new well of the Magnolia Petroleum Co. in Section 18-9-6. This is No. 1 Anderson, NE cor. NW SE of the section. This well had the Wilcox sand 4,358-62 feet, and the hole filled with oil. It was later drilled to a total depth of 4,370 feet, and it is now shut down for the period of proration before production starts. The best day's production which the Magnolia well made while being tested out was 452 bbls. on the swab for 16 hours. The fluid level in the well will not swab down below 1,200 feet, and the gas pressure is fair. With these conditions it seems that the well might follow the nature of the other wells which furnished extensions to the Earlsboro Pool. In these wells the shot made good production where wells were encountered with a good static column of oil. If the Magnolia well were shot and then placed on air lift, it is probable that it would be good for 1,200 or 1,500 bbls. daily. It will probably cover a rather limited area like the other fingers of production discovered around the Earlsboro Pool.

On the east side of the Earlsboro Pool the Magnolia has a good well in No. 2 Gilliam, NE cor. SW Section 13-9-5. This well found the Wilcox sand 4,250-64 feet, and produced 3,160 bbls. in 24 hours. It is on the air lift.

There has been one change in classification of the Greater Seminole pools, and the two pools of the Maud area have been separated. The Wilcox sand region around Sections 11 and 14-8-5 have been called Carr City, while the Misener and Hunton lime pools on the west side of the township have been given the name of the Maud Pool. This is merely in order to avoid the confusion which was caused in calling the pools east and west Maud.

It is reported that the Texas Pipe Line Co. is preparing to construct a 6-inch line from the present terminus of its Bowlegs system west into the Maud and Mission Pools. This would necessitate the construction of about 10 miles of line.

Oklahoma City Area

The Oklahoma City area is especially interesting at this time. There has been a sharp change in the output of the discovery well. This is the Indian Territory Illuminating Oil Co.'s No. 1 fee, C SW SW Section 24-11-3w. The well had been decreasing steadily and was down to 2,600 bbls. daily. It has been flowing on air lift, and the tubing had been lowered from 3,000 to 3,700 feet. The latter position of the tubing seemed to hinder the output of the well for no known reason, and while experimenting with the well the engineers placed the tubing back at 3,000 feet. The well immediately responded with an increase in output, and jumped from 2,600 bbls. to 4,147 bbls. daily.

The temperature of the well was also reported as making sharp increases, but since this temperature was taken at the tanks after the oil from the well had been treated, the normal temperature increase through warm weather probably had some effect on the well. Samples of the crude were taken from the lead line close to the control head on Monday morning of this week, and they showed a temperature which was close to normal. The latest production of the well (Monday, March 25) showed it to be making 3,750 bbls. of oil, and 100 bbls. of water for the preceeding 24 hours. The oil shows a cut of 2.8 per cent after treatment, and 4.2 per cent before treatment.

Another interesting feature of the Oklahoma City region is the fact that four wells are about to test out the 5,000-foot sand. There is one well which is a failure in the 4,200-foot sand after a good core was taken. This is the Indian Territory Illuminating Oil Co.'s No. 1 Emerson, NE cor. NE, Section 25-11-3w, which is a direct south offset to the discovery well. The Emerson well had the sand 4,146-4,221 feet, and after good cores were obtained, the well was bailed down. It showed several bailers of salt water.

North of the Allen Pool of Hughes-Pontotoc-Seminole Counties, the Sinclair Oil & Gas Co.'s No. 1 Israel Davis, in Section 7-6-8, is looking better and improving its production. This well is producing from a formation bottomed at 3,726 feet. The top of this formation is in question. The well at first started flowing 390 bbls. daily, and has steadily increased its flow until Monday morning of this week it produced 1,023 bbls. The daily average for the past week was 659 bbls. The identity of the formation was at first thought to be Viola lime, and now this theory is being questioned. Should the production of the well show a continued per cent increase, it is very likely that the formation will be called Wilcox on account of the production rather than on any fossil evidence. This well has at least opened another spot to the drill.

The crude oil storage in the Greater Seminole and St. Louis Fields shows little change. As of March 15 the steel storage (large) by the companies of the region was as follows:

Amerada Pet. Corp.	775,20
Champlin	95,12
Barnsdall	287,42
Carter Oil Co.	1,373,41
Continental Oil Co.	705,64
Empire Oil & Ref. Co.	145,73
Gypsy Oil Co.	123,23
Independent Oil & Gas Co.	456,31
Indian Terr. Ill. Oil Co.	4,910,31
Magnolia Pet. Co.	3,020,41
Mid-Cont. Pet. Corp.	156,20
Phillips Pet. Co.	207,46
Pure Oil Co.	1,071,22
Prairie Oil & Gas Co.	1,330,16
Prairie & I.T.I.O. Co.	2,755,22
Shaffer Oil & Ref. Co.	112,22
T. B. Slick (now Prairie)	1,573,80
The Texas Company	1,654,31
Tidal Oil Co.	341,26
Turman Oil Co.	336,26
White Oak Refining Co.	203,62
Sinclair Oil & Gas Co.	574,21
Total barrels	22,202,76

Carter County

Magnolia Petroleum Co. has built the rig for No. 1 Hightower, SW cor. NE Section 30-1s-3w. Devonian Oil Co.'s No. 1 Myer, SW cor. NE, Section 19-5s-3w

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Bros.' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Rigging up.
Washoma Oil Co.'s No. 1 Acre, SW cor. NE Sec. 14-24-11w	Rig.

LATTIMER COUNTY

Limestone Oil & Gas Co.'s No. 1 McMurray, SW cor. SW Sec. 15-5-18	Shut down 2,828 ft.

GRANT COUNTY

Cowden and others' No. 2 Vollmer, CEL NE SW Sec. 22-25-4w	Shut down 5,640 ft.
Larlo-Lathrop's No. 1 Cornell, NW cor. NW Sec. 24-28-3w	Shut down 3,880 ft.

HARPER COUNTY

Hoffer Oil Co.'s No. 1 Cooper, NW cor. SE SE Sec. 12-25-22w	Shut down 4,130 ft.

KAY COUNTY

Wentz Oil Corp.'s No. 1-A Ward, C NW SE SW Sec. 32-27-1e	Fishing 3,371 ft.

WOODWARD COUNTY

Sharon Oil Co.'s No. 1 Elmore, SW cor. SW Sec. 25-21-21w	Rig blown down 3,025 ft.
Prairie Oil & Gas Co. et al's No. 1 James, NE cor. NW Sec. 23-23-17w	Drlg. 2,100 ft.
Billy's Oil Co.'s No. 1 Watt, C SE Sec. 9-23-20w	Fishing 3,240 ft.
Burgoyne Brothers' No. 1 Merkins, SW cor. SE NE Sec. 15-21-19w	Shut down 1,910 ft.
Wilson et al's No. 1 Unknown, NE cor. SW Sec. 4-23-16w	Drlg. 410 ft.

GARFIELD COUNTY

E. L. Love and others' No. 1 White, SE cor. NW Sec. 9-24-6w	Underreaming 4,755 ft.

GARVIN COUNTY

Mid-Continent Petroleum Corp.'s No. 1 James, SE cor. SE Sec. 22-5-3	Drlg 2,795 ft.

KINGFISHER COUNTY

McKinney & Crawford's No. 1 Sturgeon, NE cor. SW Sec. 27-16-6w	Shut down 4,895 ft.

LOGAN COUNTY

Haley & Smith's No. 1 Guier, SE cor. SW Sec. 33-18-3w	Shut down 4,020 ft.

BLAINE COUNTY

Lowen and others' No. 1 Unknown, NW cor. SW NW Sec. 27-16-11w	Spudded and shut down; renewing leases.
W. J. Donnelly, trustee's No. 1 Dickens, NE cor. SE Sec. 26-15-12w	Dry and abandoned 4,509 ft.
Ragland and others' No. 1 Unknown, C NW SW Sec. 13-19-10w	Rig.

LINCOLN COUNTY

Phillips Pet. Co.'s No. 1 Stephens, SE cor. NW Sec. 29-12-3	Rig.
Morgan & Flynn's No. 1 Finlay, SW cor. SW Sec. 19-16-6	Rigging up.
Wheeler & Mote's No. 1 Kemmer, NW cor. NE SW Sec. 2-16-5	Shut down 2,700 ft.

MUSKOGEE COUNTY

Elk Drilling Co.'s No. 1 Jones, SW cor. SW Sec. 34-13-17	Shut down 400 ft.
L. T. Haney's No. 1 Mitchell, SE cor. NW SE Sec. 33-13-18	Dry and abandoned 2,368 ft.
J. L. Slusher's No. 1 Nave, NE cor. SW NW Sec. 20-15-20	Shut down 775 ft.
Colton & Lester's No. 1 Ellington, SW cor. NW SW Sec. 25-12-19	Drlg. 420 ft.
Colton & Lester's No. 1 Parker, C NW SW Sec. 31-12-19	Drlg. 1,260 ft.

HUGHES COUNTY

E. W. Whitney and others' No. 1 Moore, SE cor. SW Sec. 17-6-9	Drlg. 3,445 ft.

(Continued on Page 118)

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has been abandoned at 2,978 feet. Humble Oil & Refining Co.'s No. 6 Dixon, NW cor. SW NW, Section 30-1s-3w, is dry and abandoned at 4,563 feet.

Blaine County

W. J. Donley's No. 1 Dickens, SE cor. NE, Section 26-15-12w, is dry and abandoned at 4,509 feet.

Cotton County

Egger & Wallace's No. 1 Williams, NE cor. SW SW, Section 25-1s-10w, is rigging up rotary tools. Perkins & Cullum's No. 6 Priddy, NE cor. NW NE, Section 3-2s-10w, has been abandoned at 2,205 feet. Guiler & Dyson's No. 1 Thomas, SE cor. SW, Section 16-4s-12w, is dry and abandoned at 2,128 feet.

Creek County

H. U. Bartlett and others' rig is up for No. 3-B Bartlett, NE cor. NW NE, Section 18-19-9. William Sherry and others moved a machine to the location for No. 2 Holsey, NW cor. NE SE, Section 28-19-9. Magnolia Petroleum Co. is preparing to deepen No. 1 Scott, NW cor. SW SE, Section 9-18-7, Drumright Pool. Beal & Plumb's rig is up for No. 1-A Walker, NW cor. SE NW, Section 26-18-9. S. P. Smith & Coffee's No. 2 Maloney, CWL NW NW, Section 19-18-11, is spudding.

Blackwell Oil & Gas Co. made location for No. 11 Tiger, NE cor. SE SW, Section 17-17-7. Carter Oil Co.'s No. 2 Durant, NW cor. NE NE, Section 18-16-9, is rigging up to deepen from 2,750 feet. Summitt Drilling Co. and others' No. 2 Long, NE cor. SW SE, Section 25-16-11, is a machine rigging up. The Texas Company's No. 1 Posey, SE cor. NW SE, Section 11-15-10, is spudding.

Shaffer Oil & Refining Co.'s No. 1 McIntosh, SW cor. NE NW, Section 26-18-7, has been abandoned at 3,570 feet. Billingslea and others' No. 1 Stidham, SE cor. SW SE, Section 21-17-8, is dry and abandoned at 3,671 feet. Jackson & Wise's No. 1 Frank, SW cor. NW SW SW, Section 1-17-11, is a dry hole at 2,560 feet. Avers and others' No. 1 Fulsom, CWL SW SW, Section 7-17-11, has been abandoned at 2,308 feet.

A. J. Spears and others' No. 9 Glenn, NW cor. NE NE NW, Section 11-17-12, made 40 bbls. from sand at 1,722-47 feet. Tidal Oil Co.'s No. 2 Parks, SE cor. NW NE, Section 21-16-8, made 80 bbls. from sand at 3,654-60 feet. Billingslea and Shaffer Oil & Refining Co.'s No. 2 Lewis, SW cor. Section 10-15-8, made 600 bbls. from sand at 3,770-3,814 feet.

Dewey County

J. V. Bailey and others' No. 1 Smith, C SE NE, Section 18-19-18w, spudded and shut down.

Garvin County

Texas Pacific Coal & Oil Co.'s No. 4 Derdeyn, NE cor. SW SE, Section 8-1-3w, made a 40-bbl. well in sands at 1,474-1,669 feet.

Grady County

Meridian Gas Co.'s No. 4 Woods, NW cor. Section 2-4-8w, has been completed for 10,000,000 feet of gas in sand at 2,105-2,325 feet.

Jefferson County

Humble Oil & Refining Co.'s No. 2 Seay, NE cor. NW NW NE, Section 3-7s--5w, is drilling at 25 feet.

Kay County

Harris & Haun's No. 1 School Land, C N half NE, Section 36-28-1w, is running 8-inch casing at 545 feet. Oil Belt Oil Co.'s No. 2-A Murdock, SE cor. SW SW, Section 2-27-3, is dry and abandoned at 1,180 feet.

Kiowa County

Connor & Son's No. 1 Zacharias, SW cor. NW NW, Section 25-7-16w, is dry and abandoned at 508 feet. No. 1 Geis, SE cor. NW NE, Section 26-7-16w, has been abandoned at 1,712 feet. Malernee & Ketch, SW cor. NW, Section 16-6-16w, is dry and abandoned at 1,250 feet. Alexander and others' No. 3 Fuqua, SE cor. SW SW NE, Section 18-6-16w, has been abandoned at 451 feet. Head & Amphlett's No. 1 Prough, SE cor. SW SW, Section 29-6-16w, is a dry hole at 500 feet.

Hughes County

W. R. Ramsey's No. 6 Millner, SW cor. SE SE, Section 18-5-8, swabbed 435 bbls. from sand at 2,568-2,606 feet.

Logan County

Sinclair Oil & Gas Co.'s No. 4 Weber, SE cor. NE SE, Section 18-19-4w, Roxana Pool, is dry and abandoned at 4,915 feet. Gypsy Oil Co.'s No. 1 Jewel, NW cor. Section 22-18-4w, Crescent-Lovell Pool, is a dry hole at 4,390 feet.

Muskogee County

A. Tillman and others' No. 3-A Callahan, SW cor. NE SE, Section 2-14-18, is drilling at 1,050 feet. E. A. Hutchinson's No. 4 B. Mason, CWL NE NE, Section 31-15-15, is dry and abandoned at 1,661 feet. Joe Paul and others' No. 5 James, NE cor. SW SW, Section 17-14-17, is dry and abandoned at 1,501 feet. W. J. Metzger's No. 1 Taylor, CEL NE SE, Section 14-14-18, was completed for 500,000 feet of gas in sand at 892-907 feet, total depth 1,141 feet. E. A. Smith's No. 1 Maher, C SE NW, Section 21-13-19, is a dry hole at 1,100 feet.

Osage County

Kay County Gas Co. has a machine on the location for No. 6-B, SW cor. SE NW, Section 22-24-7. McCune & Wormser moved a machine out for No. 12, SW cor. NW, Section 15-24-8. Red Bank Oil Co.'s No. 1, NW cor. NE NW, Section 29-23-8, is rigging up to deepen from 2,798 feet. Nath Jones and others' No. 1, SW cor. SE, Section 28-23-9, is drilling at 210 feet. L. G. Stanley is moving a machine out for No. 7, SW cor. NW SE, Section 36-22-8. H. H. Mundy and others' No. 1, SW cor. NE, Section 4-20-9, is rigging up.

The Texas Company's No. 1, SW cor. Section 29-28-11, is dry and abandoned at 2,218 feet. Phillips Petroleum Co.'s No. 1, SW cor. NW NE, Section 33-25-6, is dry and abandoned at 3,327 feet in Wilcox sand. The Texas Company's No. 6, NW cor. SW SE, Section 30-25-8, made 190 bbls. from Burgess sand at 2,362-2,422 feet. L. G. Stanley's No. 6, NW cor. SW SW SE, Section 36-22-8, made 120 bbls. from sand at 441-67 feet. H. M. Mundy's No. 2, NW cor. SE, Section 4-20-9, is dry and abandoned at 520 feet.

Okfuskee County

C. L. McMahon and others' No. 1 Fixico, NE cor. NW SE, Section 29-12-10, made 55 bbls. from sand at 3,140-67 feet. J. J. Schock's No. 1-A Holmes, CEL SW NE, Section 29-11-11, was completed for 15 bbls. in sand at 1,633-56 feet. W. L. Umburn's No. 2 Sullivan, SW cor. SE SE, Section 1-10-11, has been abandoned at 2,950 feet.

Okmulgee County

R. E. Garrett's No. 1 F. Sneed, SW cor. SE NW, Section 9-14-13, is dry and abandoned at 2,675 feet. Shelden Oil Co.'s No. 4 Shelton, SE cor. SW SE, Section 15-13-12, made a 40-bbl. well in sand at 2,877-2,902 feet. Aiken Oil Co. and others' No. 10 S. Fox, CEL SE NW, Section 22-13-14, was completed for 15 bbls. in sand at 2,473-77 feet.

Pawnee County

Superior Oil Corp. and others' No. 1, SW cor. NW NE, Section 35-20-9, is dry and abandoned at 2,110 feet.

Payne County

Mulberry Oil Co. has the rig on the ground for No. 1 Nims, NW cor. NE, Section 5-17-5.

Pittsburg County

Quinton Spelter Co.'s No. 1 Hughes, NW cor. SE, Section 23-7-17, was completed for 2,500,000 feet of gas in sand at 2,112-2,415 feet.

Pottawatomie County

Independent Oil & Gas Co.'s No. 3 Wallace, SW cor. Section 14-7-4, St. Louis Pool, is rigging up to deepen from 4,020 feet. Magnolia Petroleum Co.'s No. 3 Robbins, SE cor. Section 15-7-4, is rigging up to deepen from 3,920 feet. Independent Oil & Gas Co.'s No. 1 Rhodd, NW cor. Section 16-7-4, is a cellar. Indian Territory Illuminating Oil Co.'s No. 1 McGee, SE cor. NE NW, Section 26-7-4, is a rig under construction.

Gypsy Oil Co.'s No. 5 Bourassa, NE cor. SE NE, Section 7-8-5, pumped 20 bbls. from Hunton lime at 4,088-4,125 feet. The Prairie Oil & Gas Co.'s No. 5 Campbell, NE cor. SE SW, Section 18-8-5, Maud Pool, was completed for 350 bbls. in Hunton lime at 4,112-15 feet. No. 6 Campbell, SE cor. NE SW, Section 18-8-5, made 375 bbls. from Hunton lime at 4,108-13 feet. Independent Oil & Gas

(Continued on Page 82)

TEST IN CENTER SEDGWICK COUNTY ACTIVITY HAS HOLE FULL OF WATER

By J. L. Dwyer

The prospects of the development of the Sedgwick County area in Kansas were dealt a heavy blow by the failure of the Jones & Kirk well last week. This well, drilling in the center of the activity, found a hole full of water at 2 feet in the sand. It is located in the NW cor. of the NW of Section 6-26-1e. It had the regular Simpson sand at 3,413-15 feet with the water. At present it is being drilled deeper in the hope of finding production in the Siliceous lime.

To the west of the Jones & Kirk well, the Skelly Oil Co. and Davis' No. 3 Wilson is looking slightly better this week. This well, reported last week, is located SE cor. NE NE Section 1-26-1w, and had considerable water in the Simpson sand. The water appears to be exhausting, and there is a chance that the well will make a good producer when it is prepared for the pump.

An interesting aspect of this particular locality is that the Skelly-Davis' Nos. 1 and 2 Wilson on the same lease may be producing from a new formation for the region. There is some question as to whether or not these two wells are producing from the Simpson, with the thought that possibly they are making their oil from the Misener formation. This would be the first Misener sand production for this territory.

The Hillsboro district of Marion County is interesting at this time. The first well of this region was Courtney B. Davis' No. 1 Rample, SW cor. NW Section 7-19-3, which produced from the chat found at 2,350 feet. The Empire Oil & Refining Co. owned an offset to this well which missed production in the chat and was drilled to 2,800 feet where it found the Viola lime productive. The Davis well was then drilled deeper, reaching the Viola this week. It found the latter formation 2,807-15 feet with very discouraging production. The well swabbed only 10 bbls. of oil an hour, which is much less than the offsets made. The Davis' No. 1 Rample is now drilling on and will explore the possibilities of the Wilcov sand if possible.

The old Eldorado Field of Butler County offers an item of interest in the completion of a well which is the seventy-fifth producer to be drilled on one single lease. It is the Empire Oil & Refining Co.'s No. 75 Koogler, SW cor. SE NE Section 19-26-5, and it had the regular sand 2,539-2,609 feet. It produced 210 bbls. of oil and 10 bbls. of water daily from this depth.

Butler County

Empire Oil & Refining Co. has the rig on the ground for No. 9 Sherrock, SE cor. SW, Section 27-27-5. No. 10 Sherrock, SW cor. SE, Section 27-27-5, is also a rig on the ground. The rig has been moved out for No. 2-A Hutchinson, NW cor. NE, Section 34-27-5.

Maxwell Oil Co.'s No. 3 Maxwell, NW cor. SE, Section 31-24-4, was completed for 15 bbls. in sand at 2,674-2,700 feet. Skelly Oil Co.'s No. 1 Adams, SW cor. Section 4-26-6, is dry and abandoned at 3,195 feet. Henderson & Holden's No. 2 Morgan, SW cor. SE, Section 14-27-5, has been abandoned at 2,791 feet. Rosenthal and others' No. 2 Marshall, SW cor. NE NW, Section 10-27-6, is producing 200 bbls. from sand at 3,123-39 feet. Dixie Oil Co.'s No. 5 Marshall, SE cor. SW NW, Section 10-27-6, has been abandoned at 3,139 feet.

Chase County

Haulkey and others' No. 1 Ryan, NW cor. NE, Section 22-19-8, has been abandoned at 250 feet.

Chautauqua County

Elmwood Oil Co.'s No. 3 Hilton, C SE SW, Section 12-32-9, is dry and abandoned at 1,415 feet. Griffin & Bell's No. 2 Julian, NW cor. NE NE, Section 2-32-10, made a 45-bbl. well in sand at 1,652-59 feet.

Coffey County

Nathan and others' No. 1 Hollern, SW cor. NE NE, Section 29-21-14, has been abandoned at 1,845 feet. Union Gas Co.'s No. 1 Read, SW cor. Section 9-22-14, is a dry hole at 1,600 feet.

Cowley County

Shawver and Marland Oil Co.'s No. 1 Stout, SE cor. NW, Section 10-31-3, is drilling at 1,800 feet. Shawver and others made location for No. 1 Liggett, NE cor. NW, Section 15-31-3. J. A. Hull made location for No. 6 Bartlow, NW cor. SW SW, Section 19-32-5.

E. W. Shawver and others' No. 1

(Continued on Page 82)

WILDCAT OPERATIONS IN KANSAS

BARBER COUNTY

Company, farm and location—	Remarks:
Allison & Fitzwilliams' No. 1 Morrisse, C NW SE SE Sec. 9-30-12w	Rig.
Barbara Oil Co.'s No. 1 Blunk, C NE NW Sec. 20-34-12w	Drlg. 5,300 ft.
Barbara Oil Co.'s No. 1 Lytle, CNL NE NE, Sec. 12-33-13w	Drlg. 4,612 ft.
Rolland et al's No. 1 Pickens, NE cor. NW NE Sec. 27-30-14w	Shut down 4,223 ft.

BARTON COUNTY

Everett & Wiley's No. 1 Ward, NW cor. SW Sec. 12-20-13w	Shut down 3,943 ft.
Mid-West Exploration Co.'s No. 1 Karst, SW cor. SW Sec. 11-16-15w	Drlg. 3,540 ft.

BUTLER COUNTY

LaRobb et al's No. 1 Bronsenger, NE cor. SW Sec. 24-27-3	Rig.
Aladdin Petroleum Co.'s No. 1 Bronsenger, NE cor. SE Sec. 24-27-3	Rig.
Smith & Ash's No. 1 Donnelly, NE cor. NE Sec. 8-24-6	Drlg. 320 ft.

CHASE COUNTY

Griener & Fowler's No. 1 Carson, NE cor. NE Sec. 9-21-7	Shut down 3,162 ft.

COWLEY COUNTY

Roth & Faurot's No. 1 Ridding, SE cor. NW Sec. 31-32-6	Shut down 3,505 ft.
Pyle & Sutter's No. 1 Lindstrom, SW cor. NE Sec. 9-35-4	Underreaming 3,405 ft.
J. B. Markey's No. 1 Tatum, SE cor. SW Sec. 11-31-6	Shut down 520 ft.
Wakefield & Osborne's No. 1 Osborne, NW cor. NE Sec. 18-30-5	Drlg. 1,740 ft.

ELLIS COUNTY

Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w	Shut down 1,100 ft.
Finney & Weiner's No. 1 Freeman, SE cor. SW Sec. 24-15-20w	Spudded and shut down.
Labette Oil Co.'s No. 1 Urban, NE cor. NW NW Sec. 19-15-16w	Dry and abandoned 3,905 ft.
Atlantic Oil Prod. Co.-D. B. Mason's No. 1 Gorham estate, C SE SE Sec. 35-15-16w	Drlg. 3,116 ft.
Phillips Pet. Co.'s No. 1 Brull, C NW Sec. 34-14-17w	Dry and abandoned 3,895 ft.

JACKSON COUNTY

Garvin & Mort.n's No. 1 Lutes, SW cor. NW NW Sec. 27-7-15	Shut down 940 ft.

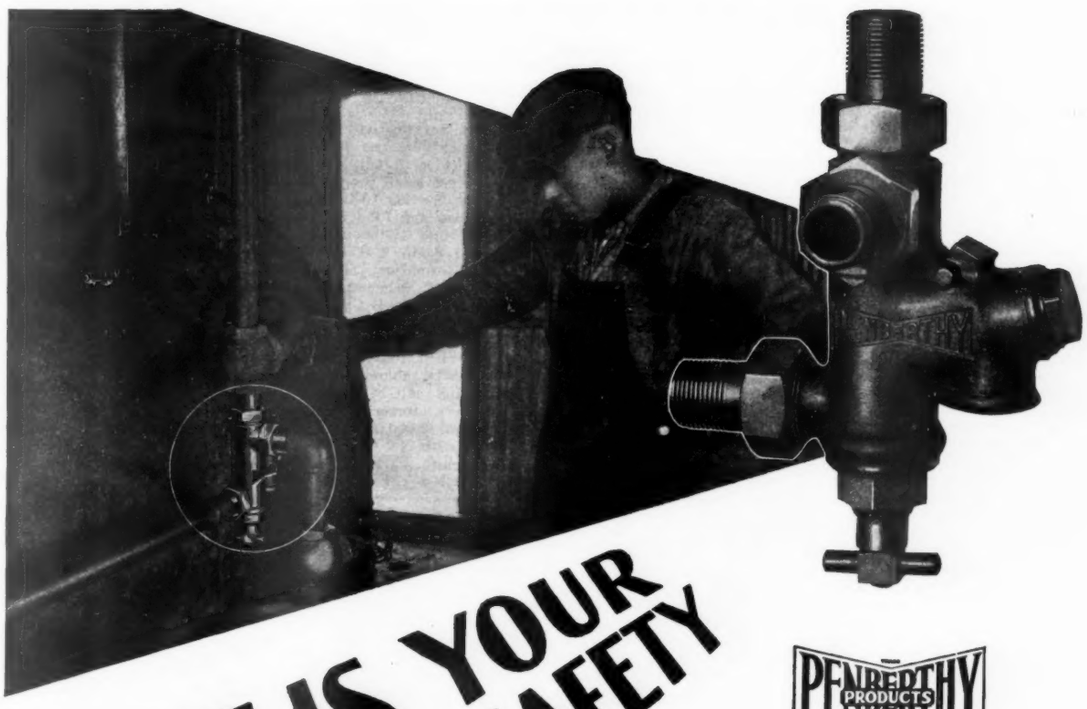
LANE COUNTY

Blankenship Pet. Co.'s No. 1 Schaeffer, NE cor. NE Sec. 24-16-23w	Spudded and shut down.

JEFFERSON COUNTY

Wichiet Oil Co.'s No. 1 Simpson, NW cor. SW SW Sec. 19-10-17	Rigged up and shut down.

(Continued on Page 121)



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Well in Pine Island Stirs High Hopes

Dixie Oil Co.'s No. 92 Dillon Gets Deepest Show of Oil and Gas Yet Found in District. Completion Waiting for Special Tools

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Mar. 25.—Dixie Oil Co.'s No. 92 Dillon, Section 13-21-15, Pine Island district of Caddo Parish, will hold the attention of operators in this division during the next few days for a variety of reasons. At 6,009 feet it obtained the deepest show of oil and gas found in this division during the last four or five years. For that matter it is the only show warranting hopes of production below the 3,800-foot level in Pine Island that any deep test outside of Cotton Valley deep Trinity horizons has produced. Last November it developed a show of gas variously estimated at 5,000,000 to 20,000,000 feet under a pressure sufficient to lift mud out of the hole, total depth of which is 6,009 feet. The hole bridged and after being cleaned out has been held full of mud while waiting for tools and equipment to drill into the expected pay. The gas was exceptionally rich and some oil men are expecting a big producer in the event it is not a tremendous gasser making gas of such high gasoline content that it will be as good as an oil well, or better.

Since this show was made between four and five months ago, the company had been waiting for a special rotary rig and a string of flush joint 4½-inch drill stem to resume operations. The material has been delivered and the new rig is moving in. The rig is designed to work against heavy pressures and on a principle new in this division. Its operations and the result of the test are of importance; especially in view of the fact that it seems whatever new production is to be obtained in North Louisiana will be from unexplored horizons several hundred feet under anything that has been tapped up to date.

Champagnolle Well Is Watched

Proven territory elsewhere in the district had little of interest to offer aside from the performance of Ohio Oil Co.'s No. 1 Raulston in Section 12-17-14, Champagnolle district, of Union County, Arkansas. It has been difficult to obtain an accurate gauge on this semiwildcat because it is flowing through choke the size of which is altered from time to time in trying to adjust it to the point where the well will be on its best behavior.

For a time the producer, the field's largest, was improving the water content of the fluid decreasing and pressure increasing, but the last report showed a decline in net oil and more water the runs for the 24 hours ending 7 a.m. March 23 being 1,565 bbls. net oil from a gross around 4,120 bbls., or approximately 38 per cent fluid. It previously had made in excess of 2,000 bbls. net oil from fluid testing about 12 per cent water.

Locations have been made and work got under way on three offsets to the well, Ohio's No. 1 B. H. Raulston in the NE cor. SE SE Section 12-17-13, one location south, and No. 1 Oliver in the NW cor. SW SE Section 7-17-13, one location east of B. H. Raulston; also Arkansas Natural Gas Corp.'s No. 1 Morris in the SW cor. NW SW Section 7, one location east of the producer and one north of Ohio's No. 1 Oliver.

Over on the opposite, or western, edge of the district, a matter of 3 miles, Lion Oil Refining Co. tested 35,000,000 feet of gas in three feet of sand on No. 2 Kelly, Section 9-17-14, total depth 2,751 feet, with a good spray of oil on drill stem test, and passed it up to core deeper for a producer getting another show of gas at 2,997-3,003 feet. Rovenger Oil Corp.'s No. 2-B Perdue, half mile north in the same section, had salt water in sand from 3,400-03 feet and was arranging for another drill stem test at 3,437-41 feet.

Area's Deepest Tests

These are the deepest tests in this part of the field and consequently are attracting notice, since no production has been obtained anywhere in Champagnolle below 3,200-3,300 feet. Skelly Oil Co.'s No. 2 Kelly, in the same section and a south offset to the Rovenger well, showed for 6,000,000 feet of gas and a spray of oil at 2,830 feet and set 8¼-inch for a test of this shallow lens.

In the center of the old deep sand area Magnolia Petroleum Co.'s No. 3 Alice Gregory in Section 15-17-14, was completed at 2,855 feet, flowing 120 bbls., 3 per cent water, from 6 feet of sand. Ohio Oil Co.'s No. 1 Adams, Section 7-17-13, a half mile north and a little east of their Raulston producer, was abandoned at 3,212 feet as a dry hole. It is offset on the east by another duster at the same approximate depth and on the south by a good gasser.

Louisiana Oil Refining Corp.'s No. 1 Manly, a semiwildcat on the east edge of Stephens, in Section 15-15-19, Ouachita County, was checking 200 feet higher than the McDonald wells in the new Ouachita County Pool when it topped red shale at 2,535 feet, surface elevation being 241 feet, and is in blue sandy shale at 2,822 feet. It could have been made a well in the Nacatoch, the original Stephens pay, but, designed as a test of the deeper strata in that district, passed up the show at 2,166-83 feet and another at 2,389-99 feet.

Arkansas Natural Gets Small Producer

The Clarksville gas field of Johnson County yielded Arkansas Natural Gas Corp. another small producer with No. 1 McPherson, Section 10-10-24, which is estimated good for 7,000,000 feet flowing between 8 and 10-inch through bradenhead, total depth 2,447 feet, in 17 feet of broken formation. Other completions in the district were: Arkansas Natural Gas Corp.'s No. 10-B Urania, Section 17-10-2e, La Salle Parish, pumping 75 bbls. from 5 feet of sand, total depth 1,519 feet, and H. L. Hunt's No. 6 Urania, Section 2-9-1e, abandoned at 1,281 feet after testing salt water in sand from 1,245-61 feet. Imperial Oil & Gas Products Co. got 2,000,000 feet of gas from 2,200 feet with No. 6 Stubbs, Section 14-19-3, Ouachita Parish. Magnolia Petroleum Co.'s No. 1 United States, Section 18-19-3, Ouachita, gauged 2,250,000 feet at 735 pounds, total depth 2,265 feet.

Pipes & Mack completed No. 1 McGee, Section 10-18-4, Ouachita Parish, making 6,000,000 feet of gas, total depth 2,185 feet, and United Carbon Co.'s No. 1 Spade, Section 32-19-4, gauged 3,500,000 feet total depth 2,185 feet. Odell & Lawton put No. 5 Richardson, Section 25-13-11, Bull Bayou district of Red River Parish, which has been standing at 2,560 feet for three months, on the beam making an initial 5 bbls. net oil. United Carbon Co.'s No. 1 Reed heirs, Section 12-20-3e, Union Parish, in the Monroe district, gauged 11,772,100 feet of gas, total depth 2,144 feet. S. H. Gardner's No. 4 Brumble in the B. C. Jordan Survey of Panola County, Texas, was completed at 2,715 feet making 2,000,000 feet of gas.

Little Effect in Daily Runs

Production from the Ohio's Raulston well had little effect on daily average runs from the field as a whole, in comparing the week's shipments with the average of the week before, the total being a drop of 230 bbls. on a run of 110,530 bbls. per day. Champagnolle runs increased 325 bbls., but the usual decline from the whole division erased the advantage, Caddo heavy runs accounting for 175 bbls. of the decrease. In other pools the fluctuation was mostly downward and ranged from 5 to 70 bbls. After Champagnolle the largest increase, in Caddo heavy runs, was 90 bbls. Daily average runs from the several pools were:

NORTH LOUISIANA	
Caddo, light	8,195
Caddo, heavy	3,325
Homer	4,000
Haynesville	5,470
De Soto-Red River	3,930
Elm Grove	580
Bellevue	640
Cotton Valley	3,015
Urania	5,960
Pleasant Hill	450
Sarepta-Cartersville	260
Total	35,825
ARKANSAS	
El Dorado	4,580
Smackover, light	6,360
Smackover, heavy	49,875
Stephens	1,020
Nevada County	1,245
Lisbon	1,425
Champagnolle	10,100
Bradley	100
Total	74,705
Both states	110,530
Last week	110,560
Decrease	30

NORTH LOUISIANA

Bossier Parish

Bellevue—R. L. Crook set 6-inch at 386 feet, corrected depth, on No. 10 Larkin, Section 14-19-11, and temporarily abandoned the hole at 430 feet; No. 11 Larkin, 920 feet south and 600 east NW cor. SW, same section, started drilling March 17, set casing at 372 feet and is waiting for standard rig to pump, total depth 381 feet.

Elm Grove—C. W. Jones has derrick up for No. 1 Harton in Section 31-16-11, location not checked.

Caddo Parish

Greenwood—J. O. A. Carper, trustee, has derrick up 660 feet south and east NW cor. Section 34-18-16, for No. 2 Hammock and is moving in rig. Eastern Carbon Co. cored sandy shale and shut down for orders at 2,625 feet on No. 4 Bryson, Section 8-17-16. Loraine Syndicate plugged back from 2,817 to 2,350 feet on No. 1-D Bryson, Section 18-17-16, and tested an estimated 2,000,000 feet of gas.

Mooringsport—Falcon Oil Co. has rig up to drill No. 1-B Muslow, Section 29-20-15.

Oil City—Magnolia Petroleum Co.'s No. 18 Doan-Thigpen, Section 6-20-15, is in lime at 2,143 feet. C. B. Moore has rig up for No. 5 Dillon, 600 feet north and 200 feet east SW cor. Section 22-20-15. Shreveport Oil Corp. set 6-inch at 2,120 feet on No. 2 Guy, Section 32-21-15, and is waiting for standard rig to pump, total depth, 2,124 feet. Simplex Oil Co.'s No. 4 Baird, Section 22-20-15, set 100 feet of 10-inch.

Hosston—Bayou State Oil Corp.'s No. 26 Jolly, Section 22-22-15, is waiting for standard rig to pump from 1,003, total depth and No. 27, 200 feet north and 550 west SE cor. SE NW, same section, is a rig.

Pine Island—Dixie Oil Co. is rigging

(Continued on Page 141)

NEWEST POOL IN ARKANSAS NOW IN COMMERCIAL PRODUCTION

By D. H. Bancroft

SHREVEPORT, La., Mar. 25.—Arkansas' newest oil pool got into production on a commercial scale Friday when the Texas Pipe Line Co. completed 5½ miles of 4-inch line from its Louann (Smackover) gathering system to C. H. McDonald's No. 1 Wilson in Section 25-15-18, half way between Louann and Stephens production, and made an initial run at the rate of 1,200 bbls. daily. No formal posting of this oil has been made, but the company is paying the Louann schedule of 90 cents per barrel. The well itself, which has made in excess of 3,000 bbls. clean oil—that being the amount saved in steel and earthen storage during the week the producer has been flowing—is holding up to its average of 220-250 bbls.

Reference to this well is made as opening "Arkansas' newest oil pool." One well doesn't make a pool, and the two or three offsets started and reported about to start will be kept tab on as determining whether it is a discovery well or whether it has happened to hit an isolated "pocket," it might be said, of commercially productive sand. But most opinion is that it has opened a new pool—probably like Lisbon or Stephens, nothing sensational but long lived small producers.

McDonald Brothers' No. 1 Wilson, a quarter mile south of the producer, set liner at 2,854 feet on account of heaving shale and will make a few feet more hole. Rated 5 feet lower than the producer the bottom is 2 feet in sand. C. D. Thornton, F. A. Buck and Small, reported as the backers of McDonald Brothers on No. 1 Wilson, which set liner, have taken over the E. L. Foster 500 acres south of this test and will proceed to drill No. 1 Smith, Section 8-16-18, which Foster drilled to 100 feet and shut down. Timberlake and others, of Camden, and other individual operators are reported getting ready to drill in the new territory and Magnolia Petroleum Co. has begun work on No. 1 Wilson in the discovery section. These operations are north and south of the producer and Flaucher and others' No. 1 Buck in Section 7-15-17, 3 or 4 miles northeast, will help demonstrate the possibilities of stuff on that side. So far there are no proposed tests on the west.

Show in Ashley County

J. G. Marcum, trustee, No. 1 DeYampert, Section 11-18-4, Ashley County, reported having a show of oil, is coring at 3,282 feet. It had a cap at 3,237-38 feet and 3 feet of sand showing a trace of oil directly under it. From 3,241-43 feet the sand was full of water. On these figures the show was found 137 feet under the top of the red beds.

Atlantic Oil Co. is expected to start work soon on No. 1 Bledsoe, Section 20-15-7, deepening it from 2,550 feet where it was abandoned as a dry hole two or three years ago by Rhodes and Kirker. Harris and others have reblocked the acreage and disposed of a one-fifth interest each in the 4,000 acres and the well to Lion Oil Refining Co., Atlantic Oil Producing Co., Amerada Petroleum Corp. and Standard Oil Co. When Atlantic finishes its No. 1 Houston, Section 30-11-6, Sharkey County, Mississippi, which it will probably do before this is printed, it will move the rig to the Bledsoe location. The Houston test is in hard limey formation the identity of which has not been established but which is thought to be the same stuff as The Texas

(Continued on Page 81)

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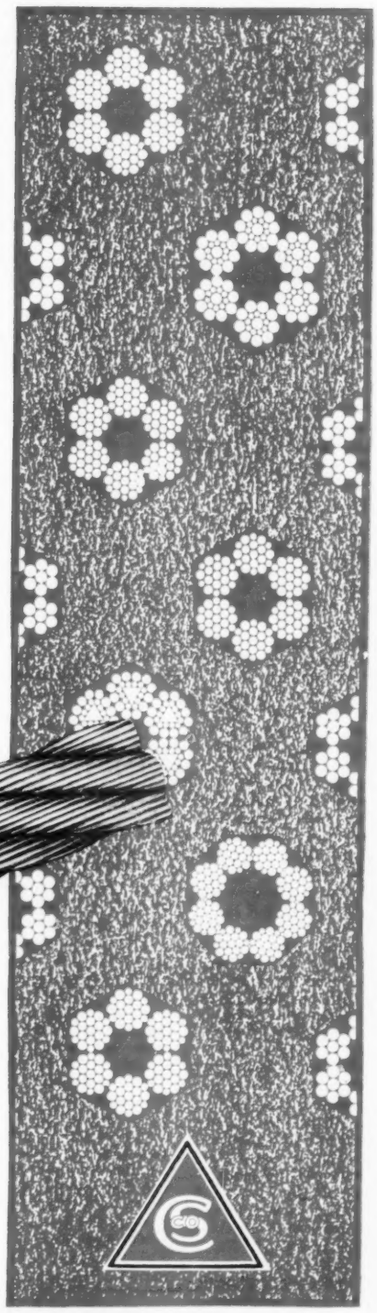

CONTINENTAL

Joe Bruner Well Flowing 4,500 Bbls.

Production of Field Reaches New Peak of 33,650 Bbls. and Can Be Run Up to 50,000 Bbls. or More

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Mar. 25.—Humble Oil & Refining Co.'s No. B-5 Moses & Baggett in the Joe Bruner Field came in Saturday flowing at the rate of 4,500 bbls. of oil a day, estimated. The final depth is not available but it is in the Edwards lime and presumably at normal depth of a little below 2,700 feet. It had the Buda at 2,526 feet, and may have the Edward a little high. The well is in the northeast end of the field. It is two locations south and a little east of Cranfill & Reynolds' No. 1 Northcutt, reported a good well recently.

Joe Bruner Field Up

Production of the Joe Bruner Field in Caldwell County which has varied a little up and down, but tending upward, has reached a new peak of 33,650 bbls. in a 24 hours' gauge last Thursday. Gulf Production Co. that day had 10,850 bbls. though the Gulf's peak day was over 11,000, and it is the biggest producer in the field. Shell Petroleum Corp.'s production that day was 8,340 bbls. It would be a simple matter to run the production of the field up to around 50,000 bbls. a day, or possibly more, and the production will no doubt get considerably larger than at present due to the necessity for drilling offsets and small tracts, but the Gulf and Humble companies each have some acreage that will permit them having inside locations that need not be drilled, and the understanding is the disposition will be to drill only necessary locations. Golden West Oil Co. and Sun Oil Co., farther south in the field, have a great many locations that could be drilled but are now not being drilled.

In the Bruner Field the features of the week were the production and the Humble company's No. 1 Hanson in the northeast end, which Saturday was reported making about 200 bbls. of oil and considerable water. The well is near the center of the north half of the James Hinds Survey and should have been a good well. Possibly it may turn out to be so yet. It is directly in line and the Capps and others' No. 1 New east of it making oil would indicate that it is not too far east. These wells of the Humble company and Capps are at the extreme northeast end of the field as at present developed. Shell Petroleum Corp. has four locations and is moving in some of them immediately north of the Capps and others' No. 1 New. There is a mile and a half of undrilled territory between these wells and the Humble company's No. 1 and No. 2 Johnson, which are the nearest producers on the southwest and nothing drilling between them at this time to help shape the field.

On the southwest end of the Bruner Field it looks like Forest Oil Co. has a well on the Fleming lease. Casing was set and cemented at 2,730 feet, and it was drilling in late in the week with indications it would make a well. It extends the field a few locations in the direction of the North & South's dry hole on the Baker lease. Golden West Co. lost its No. 8 Wilson when the casing collapsed. Hadley on the Merriweather is down about 2,600 feet and should be in the pay if there is any there by the last of this week. Ratcliff's No. 1 Cora Malone, which has been standing for some time and is the farthest south well, is now at work again with new outfit and will try to complete it. It has been flowing several barrels a day in uncompleted condition and should be good for 150 bbls. or more a day on the pump. It has held up things down that way as folks waited to see what it would do. Hadley's No. 4 Merriweather at 2,600 feet is a little north of it and between the Ratcliff well and the Forest Oil Co.'s No. 1 Fleming, so Hadley by all signs should get a well.

Laredo District

None of the completions in the Laredo territory the past week seemed to add anything new with the exception perhaps of O. W. Killam's No. 7 Bruni at Bruni station in sand at 1,387-90 feet which had a showing of oil and is setting casing at 1,370 feet. It showed three joints of sand and oil and seems to be a new sand for that area.

Humble Oil & Refining Co. and Reiter-Foster's No. 19 Kohler is a 35,000,000-foot gas well in sand at 1,831-36 feet. It is the sixth gas well in this new area, is nearly a half mile southeast of the most southwesterly well in the area and is twice as big as any of the other wells.

The only other completion in the Laredo territory was the Magnolia Petroleum Co.'s No. 1 Benavides, 150 feet south and west of the center of Survey 697 in the Magnolia-Cole Pool in Webb County, a 35,000,000-foot gas well in sand at 2,330-41 feet. It had gas wells on three sides of it a half mile away, so it adds nothing but production.

Refugio Field

Mission Drilling Co. at 3,910 feet in its No. 1 Mitchell in the south edge of the city of Refugio and east of the Refugio Field about 7,000 to 8,000 feet, shows a little gas. The Nellie B. Cummins, a gas well at around 3,700 feet, is the nearest production and it is 7,000 to 8,000 feet west. Question is whether No. 1 Mitchell is getting at 3,910 feet what the Nellie B. Cummins got at 3,700 feet. No. 1 Mitchell got no sand at 3,700 feet.

Two miles north of the Refugio Field Magnolia Petroleum Co. twisted off at 4,230 feet in No. 1 Glenewinkle and has had to come back to 1,800 feet and sidetrack.

Rain Delays Work

Rains have delayed field work all over Southwest Texas for two weeks. Saturday and Sunday the sun shone bright and there was a chance that the roads would quickly dry. In many cases it has been impossible to get into the locations with equipment and fuel oil and hence very few tests have been able to make any drilling progress.

COMPLETIONS

Bexar County

Amelia Balzart's No. 1 Adams, Cortari Survey, at 700 feet is estimated a 4-bbl. well.

Caldwell County

Gulf Production Co.'s No. 6 M. J. Tiller, 300 feet east of No. 5, completed at 2,744 feet on pump.

Gulf Production Co.'s No. 1 J. D. Wright, G. Hinds Survey, has been completed at 2,646 feet, estimated 585 bbls. in 27 hours.

Gulf Production Co.'s No. 2 Carter, G. Hinds Survey, completed at 2,676 feet pumping 600 bbls.

Gulf Production Co.'s No. 3 Carter, G. Hinds Survey, has been completed at 2,576 feet for 250 bbls.

Gulf Production Co.'s No. 4 M. J. Tiller, G. Hinds Survey, completed at 2,713 feet for 250 bbls.

Gulf Production Co.'s No. 3 M. J. Tiller, G. Hinds Survey, has been completed at 2,724 feet making 650 bbls.

Humble Oil & Refining Co.'s No. 2-B Moses & Baggett, S. Shupe Survey, has been completed at 2,699 feet for 750 bbls. flowing.

Humble Oil & Refining Co.'s No. 1 Floy Gray, James Hinds Survey, completed at 2,687 feet for 865 bbls. in 24 hours.

Humble Oil & Refining Co.'s No. 8 W. O. Allen has been completed at 2,744 feet.

Sun Oil Co.'s No. 5 Malone, A. Floyd Survey, completed at 2,719 feet for 42 bbls. on the pump.

Shell Petroleum Corp.'s No. 7 F. Tiller completed at 2,677 feet pumping 350 bbls.

The Texas Company's No. 6 Merriweather, completed at 2,783 feet, made 102 bbls. in 24 hours.

Duval County

Humble Oil & Refining Co.'s No. 19 Kohler, Survey 424, completed at 1,836 feet making 35,000,000 feet of gas.

Webb County

Magnolia Petroleum Co.'s No. 1 Benavides, Survey 697, Block 10, completed at 2,341 feet making 35,000,000 feet of gas.

Zapata County

O. W. Killam's No. 12 Cuellar, Cerrito Blanco grant, has been completed at 1,480 feet making 100 bbls.

ABANDONED TESTS

Frio County

Austin Johnson and others' No. 1 Eschenburg, Survey 788, drilled less than 200 feet and abandoned.

Pilgrim Oil Co.'s No. 2 Blackaller, James Gouley Survey, plugged and abandoned hole at 3,320 feet.

Guadalupe County

Trinity Drillers' No. 1 Baptist Landmark Association, Townsite of Kingsbury, has been abandoned at 2,260 feet in Edwards topped at 2,194 feet.

Gonzales County

Empire Gas & Fuel Co.'s No. 1 Riverbed, Winslow Turner Survey, is dry and abandoned at 4,076 feet.

Jim Hogg County

The Texas Company's No. 1 D. Vela, Survey 582, Share 4, is dry and abandoned at 2,556 feet.

A. L. Kitselman's No. 1 Holbien, Share 3, Survey 3 Block 9, is dry and abandoned at 2,240 feet.

Refugio County

J. M. Davis and Tom Horn's No. 1 Howard, Section 8, has been abandoned dry at 3,030 feet.

Houston Gulf Gas Co.'s No. 1 Rooke at 2,400 feet blew out gas, wrecked derrick and hole has been abandoned.

NEW LOCATIONS

Bexar County

Amelia Balzart's No. 2 Adams, Cortari Survey, is location 150 feet west line, 300 feet south line.

W. M. Morgan's No. 1 H. L. Martin is location.

J. Morgan Russell's No. 1 G. A. C. Halff is location in city limits of San Antonio.

Blanco County

H. J. Uhl and C. E. Seldman are mak-

(Continued on Page 78)

NEXT POOL IN SOUTHWEST TEXAS MAY BE NORTH OF THORNDALE

By B. D. Stevenson

SAN ANTONIO, Tex., Mar. 25.—Chances that the next oil pool to be developed in Southwest Texas will be the area around the Michalk & Clarke's No. 1 Johnson in southwestern Milam County, a few miles north of Thorndale, were greatly enhanced when the well bailed 50 bbls. of oil and no water early in the week at 1,942 feet. It is in the Buda lime. For several miles running north from the well the acreage has been leased, Rogers & Heep having the first block 1 mile north of the well, The Texas Company then coming in for a bigger block, and north of that Gulf Production Co. with about 3,000 acres. Three derrick patterns were moved out last week, one for the Rogers & Heep No. 1 Duncan, one for the Lloyd Oil Corp., 1,000 feet north of the Michalk & Clark well and one for E. L. Chapman of Fort Worth, 1,000 feet west on the Kirkman farm, 150 feet each way from the southeast corner. Michalk & Clark will also drill another well. Their No. 1 is not entirely completed. They raised the casing 80 feet before bailing. It is in rather poor condition, but is an oil well in the shallow formations. It is a little west of the line of production of the Rockdale Field and is probably on a separate and distinct structure. Several miles north in the Gulf Production Co.'s block there is an old 750-foot well on the Dilworth farm that is estimated good for several barrels of oil a day if put on the pump. It is producing from the Pecan gap of the Taylor marl series.

Gonzales County

Empire Gas & Fuel Co. has abandoned its river bed test at 4,076 feet, dry. It is nearly a half mile west and a little south of the company's No. 1 Norwood, the discovery well of that territory. It was first getting formations relatively high, but was dry nevertheless. This is the third dry hole since No. 1 Norwood came in for about 150 bbls. a day at the top of the Austin chalk. While there is as much room, usually, for difference of opinion on the proper place to locate a test as there is over a horse race, nevertheless Cranfill & Reynolds' No. 1 Webb, 600 feet southeast of No. 1 Norwood, is the only one of the three relatively close to the discovery well. Furthermore, the trend of all fields in the Balcones fault zone is northeast and southwest and the first location offsetting a new well is in one or other of those directions. Indiana Petroleum Co. located its dry hole a half mile from the discovery well and only a little west of south, and the Empire Gas & Fuel Co. located its river bed test nearly due west and a half mile away. Northeast and southwest have been untouched and Empire Gas & Fuel Co. has located its No. 2 Norwood northwest of No. 1 and is moving in. Benedum & Trees and William F. Morgan have located their No. 1 Lamkin, 1½ miles south and a little west of the discovery well. It has spudded in.

Victoria County

Humble Oil & Refining Co. started to unload a rig at Victoria to drill the company's first deep test near Nursery in the northern part of the county.

Miscellaneous Wildcats

Rycade Oil Corp.'s No. 3 Chittim in Maverick County, which started off as though it would be a gusher of several thousand barrels, is now mostly sulphur water.

In the stretch of counties between San Antonio and San Angelo there is quite a little leasing activity and some new wildcats to start. Four new wildcats are to be started near London in northeastern Kimble County.

Donaldson Oil Development Co. failed to make a well out of the No. 1 Adams Co. in southeastern Medina County, but

(Continued on Page 126)

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Promising Developments in Gulf Area

Lost Lake, Barbers Hill, Old Hackberry and Humble Figure in Latest Prospects Interesting Operators

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Mar. 25.—Although from an actual completion standpoint field news in Gulf Coastal fields was unusually light the past week, assurance of a rapid succession of interesting developments at Lost Lake, where a wildcat has been trying to blow-out, at Barbers Hill, where three tests in the new deep sands are waiting to be tested, at Old Hackberry, where a newly opened pool is being drilled to major proportions, and at Hunmble, where another deep sand gusher, which blew in ten days ago and sanded up, is to be retested, was given coastal operators over the week end.

Barring unexpected declines in present producing wells, materialization of at least a few of these developments into good wells probably will result in additional increases in coastal production the coming week which already have sent the daily average output to a new peak for the past year and a half. The rising daily output of the new fields, including Clay Creek, Washington County, where the production late in the week was above 4,300 bbls. daily pinched in, DeWalt, which is running around 9,800 bbls., and Hackberry, whose daily average the past week was nearly 8,400 bbls. and Barbers Hill is having a very noticeable effect on the total coastal figures.

Daily Average Production

The daily average output the past week of strictly coastal fields (southeast Texas and southern Louisiana) climbed above the 150,000 bbl. mark. As completions were considerably fewer than usual, the increase was not so great as has been the case the previous few weeks. In Southwest Texas, continued gains of the Bruner Field, resulted in an increase of 4,201 bbls. in the daily average for the district. The fields and their respective daily averages in both the Gulf Coast division and Southwest Texas for the week ending March 23, are:

GULF COAST

Texas

Allen	10
Barbers Hill	7,800
Batson	1,437
Big Creek	3,646
Blue Ridge	3,843
Brenham	150
Boling	1,972
Clay Creek	4,315
Damon Mound	650
DeWalt	9,775
Fannette	748
Goose Creek	6,618
High Island	1,585
Hull	10,193
Humble	4,962
Jasper	24
Markham	409
Nash	600
North Dayton	460
Orange	2,922
Orchard	71
Pierce Junction	12,479
Raccoon Bend	1,912
Saratoga	945
Sour Lake	2,724
So. Liberty-So. Dayton	5,900
Spindletop	33,928
West Columbia	7,941
Total	128,019
Total previous week	129,800
Decrease	1,781

South Louisiana

Anse La Butte	45
Bayou Bouillon	240
Edgerly	874
Jennings	844
Hackberry	8,371
Lockport	4,179
Sorrento	469
Starks	564
Sulphur	2,025
Sweet Lake	360
Vinton	4,559
Welsh	30
Total	22,500
Total previous week	19,181
Increase	3,319
Total Gulf Coast	150,519
Total previous week	148,981
Increase	1,538

Southwest Texas

Dale	597
Bruner	32,713
Gonzales	60
Kingsville	275
Larremore	237
*Luling	12,586
Lytton Springs	1,136
Maverick	0
McMullen	55
Medina	25
Miranda	13,354
Refugio	1,063
Somerset	1,881
Yoast	1,950
Total	65,932
Total prevous week	61,731
Increase	4,201

*Includes: Caldwell County, 8,295 bbls.; Guadalupe County, 4,291 bbls.

Increase at Hackberry

At Hackberry, as can be seen in the table, the daily average for the week was 8,371 bbls., an increase of 3,693 bbls. This is the second development period in the past year in the Hackberry district, the first being in the East Hackberry field, opened November 5, 1927. Production at the peak of operations on that dome the middle of 1928 reached similar proportions as at present but since has dropped off with a slackening of work there but now with the opening of another field on the south flank of the old Hackberry Dome (approximately 3 miles west of East Hackberry) production of the district again is mounting sharply.

Although opened only last December, six producers already have been completed at old Hackberry, two adding 2,600 bbls. of daily flush production being brought in the past week, and as this is written four additional tests are in the sand with casing cemented to test, and 12 others in that immediate vicinity are near the sand depth between 3,100 and 3,300 feet or will be within a few days. Due to the extremely cut up acreage at old Hackberry, a drilling play, one of the most active on the coast in years, has been forced.

The best well completed during the week was at old Hackberry, which was Federal Petroleum Co.'s No. 1 Kaough, a west offset to Moon Oil Co.'s No. 1 Sanner, the second producer. That well made an initial flow of 1,500 bbls. pipe line oil from sand at 3,214 feet although now it is flowing less than 500 bbls. daily. No. 2 Kaough, a location north, which came in 1,000 bbls. the past week increased to 1,800 bbls. daily.

Barber Hill Tests

At Barbers Hill, Chambers County, three more tests, two on the southwest flank, and one on the southeast flank, have reached the recently opened deep sands and have casing cemented to test. Operators at present are watching in particular Yount Lee Oil Co.'s work on the southwest flank, where the discovery well brought in last January with an initial production rated at 4,000 bbls. daily still is producing at the rate of more than 3,500 bbls. daily. The consistent staying quality of this well is beginning to be the talk of coastal operators and is causing the "Hill" to be looked upon in considerably better light.

Deep wells on the southeast side also have shown tendencies to hold up, as indicated in the discovery well, Mills Bennett Production Co.'s No. 1 Smith and two subsequent completions by Humphreys Corp. Several failures in that area, however, have indicated irregularities common to coastal salt dome fields. No. 1 Smith Saturday was being worked over, and three-inch screen was being set inside the four-inch in an effort to restore its production. This well, which made quite a record as a 4,000 bbl. well and holding up for more than a month, is the one which two weeks ago caused some interest when it unexpectedly came back in after flowing around 200 bbls. daily for several months and increased its flow to 2,400 bbls. net oil, then sanding up.

Humble's Latest

At Humble, South Texas Petroleum Co.'s No. 3 Morris which blew in ten days ago with a gusher flow of pipe line oil from the deep sand at a total depth of 4,831 feet on the south side of the field, Saturday was flowing approximately only 230 bbls. daily with the screen blown 45 feet up in the casing, the bottom of which is at 4,110 feet. The well is estimated to have made 1,000 bbls. hourly in the three hours before sanding up.

Although the company so far made no effort to pull the screen and reset it probably will do so in a few days. For the past week it has been satisfied in letting the well flow with the screen up in the casing. If the screen can be reset successfully, operators are confident of this well making the best of the three so far brought in from the deep sand on the south side.

Increasing the interest in the possibilities of this district, The Texas Company's No. 39 Stevenson, offsetting the Morris tract on the north, tried to blow-out with a heavy gas pressure while drilling at 4,436 feet. Efforts Saturday were centered in trying to kill the gas, and, as no oil showed, the hole probaly will be deepened.

Lost Lake

Pure Oil Co. also is still trying to kill the gas which early in the week blew the screen up in the hole in its No. 1 Mayes on the Lost Lake Dome in northern Chambers County, so far unproductive. This test, blew out in an attempt to test a very rich showing oil sand at a total depth of 2,701 feet. The hole had been bailed down only about 250 feet when the well started coming in. The bailer was pulled and the well put on chokes but the gas pressure has been so strong that the gas late Saturday had not been killed. Water is being pumped into the hole under a pressure of 1,100 pounds.

Production at Raccoon Bend, Austin County, was extended approximately 2,000 feet southeast by Humble Oil & Refining Co.'s No. 1 J. W. Wilson which flowed initially at the rate of only 300 bbls. of fluid, 82 per cent oil. The oil is 19 gravity. The sand, which is a total depth of 2,680 feet, is the shallowest from which a commercial producer has been completed at that field, the main sand being below 3,200 feet.

Wildcat South of Boling

On the south side of Boling, Wharton County, Vacuum Oil Co. put its No. 1 Taylor, a wildcat, on the pump and at 2,920-42 feet making approximately 150 bbls. daily. This is the same sand, from which the well originally blew out and made a small producer for a few days, later being deepened to the salt at 3,177 feet and being plugged back.

Other producing completions were Rex Petroleum Co.'s No. 14 Carbello, Orange, a workover, pumping 8 bbls. net at 3,340 feet; Green Oil Co.'s No. 6, a Moore, Edgerly, a workover, flowing 50 bbls. net oil, 2,932 feet, and Deutser Oil Co.'s No. 19 Trustee, Batson, pumping 10 bbls. net, 1,005 feet. T. W. Horn completed another small pumper in the old Humble shallow field. This was his No. 32 Herman.

Grimes County Prospect

A small lease play has been going on in Grimes County between Courtney and Navasota, near Chaille, where another salt dome prospect has been discovered. That district was "shot" by Pure Oil Co., which has taken up some acreage at a reported $2.50 along with The Texas Company. The proposition is held generally by Cranfill & Reynolds, it was reported in Houston. This is approximately 25 miles east of Sun Oil Co.'s Clay Creek Field and a similar distance north of Raccoon Bend.

Grimes County is north of what is considered as the Gulf Coast. Very little wildcatting has gone on there and the salt dome prospect, if it is such, is the first discovered.

TEXAS

Hackberry-Cameron Parish

In the new field opened on the south side of the old Hackberry Dome, Federal Oil Co.'s No. 3 Kaough, which drilled into heaving shale to 3,276 feet and plugged to 3,174 feet and set 6⅝-inch casing at 3,140 feet, has drilled plug and set screen to test a showing there. The latter company's No. 1 Duhon also is in the sand at 3,248-72 feet and is waiting on casing cement (cemented at 3,246 feet) to set. Sun Oil Co.'s No. 1 Vincent is waiting on casing cement to set to test a sand showing oil at a total depth of 3,188 feet and Yount Lee Oil Co.'s No. 1 Kaough is in sand and shale showing oil at 3,114-18 feet and has 6⅝-inch casing cemented.

Cherokee Oil Co.'s No. 1 Duhon drilling sand and shale at 3,307 feet. Fraim Oil Co. (Coastal) is drilling water sand at 3,352 feet. Federal Oil Co.'s No. 4 Kaough is milling on junk in the hole at 2,991 feet. The latter's No. 2 Duhon is drilling sand and boulders at 1,060 feet. Cameron Oil Co. and Rycade Oil Corp.'s No. 1 Kaough is drilling gumbo at 216 feet. Moon Oil Co.'s No. 3 Sanner has spudded in. Pure Oil Co.'s No. 1 Duhon is drilling sand and gravel at 970 feet and the latter's No. 2 Duhon is in gumbo and shale at 823 feet. Rex Petroleum Co.'s No. 1 Vincent is drilling gumbo at 3,200 feet. Sun Oil Co.'s No. 2 Vincent is drilling sand at 3,105 feet. Yount Lee Oil Co.'s No. 2 Vincent is drilling gumbo and boulders at 3,160 feet. Sunshine Oil Co., a newly organized company, which has acquired a small tract within a short distance of production, has a derrick up for No. 1 Benoit.

On the west side of the dome, where another pool apparently was tapped recently by Rycade Oil Corp., in its No. 1 Gulf Land, a pumper, Rycade Oil Corp. and Humble Oil & Refining Co.'s Joint No. 1 Gulf Land is drilling gumbo and lime. The latter's No. 2 Gulf Land is drilling clay at 67 feet, having just started drilling.

At East Hackberry, Calcasieu Oil Co.'s No. 6 Valery is drilling rock at 1,650 feet. No. 5 Dorion in shale and boulders at 2,949 feet.

Barbers Hill—Chambers County

On the southwest flank of the dome, Yount Lee Oil Co.'s Nos. 2 and 3 have reached the pay sand which has made such a good well for No. 1 Chambers, and have cemented casing to test. Total depth of the No. 2 is at 5,189 feet and that of No. 2 at 3,019 feet. This company's No. 4 Richardson, same flank, is drilling sand rock at 2,249 feet. Sun Oil Co.'s No. 1 Chambers is drilling gumbo at 4,678 feet, and Gulf Production Co.'s No. 1 Fisher fee is drilling sticky shale at 4,991 feet.

On the southeast flank, Joe Bashara's

(Continued on Page 125)

When *deeper* wells are pumped *Axelson* will pump them

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Jal Area Has 20,000,000 Foot Gasser

Barrier Creek Structure, Utah, Encouraging. Twenty Wells Going Down in Vineland, Colo. Billy Creek Well Not So Good

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Mar. 23.—A 20,000,000-foot gas well for the Midwest Refining Co. in its No. 13 C. Farnsworth, Section 13-26-36, southeastern New Mexico, and failures in the Marland Production Co.'s No. 1 Reed and No. 1 Warren, were the principal developments of the week in Lea County. The Marland's No. 1 Lockhart was making around 250 bbls. a day when it was shut in for more storage, the tanks being full.

A show of oil and gas in the Phillips Petroleum Co.'s wildcat in Wayne County, Utah, at 4,751 feet, was the principal development in that State, with several wells resuming after being shut down on account of the weather.

The Vineland district southeast of Pueblo supplied the principal news for Colorado, more wells being started, and arrangements being made for completing and testing the discovery. The Texas Production Co had a little water in the Morrison in its No. 11 Knowlton, a Sundance test on the Moffat Dome, and the same company has an average producer in its No. 6 Quaintance-Hocking at Tow Creek. Several new tests are being started in northwestern and western Colorado.

Wyoming is still suffering from storm conditions. The Carter Oil Co.'s Billy Creek well, which was promising a new light oil field, failed to come up to expectations when cleaning out began, the gas having disappeared and the oil being very heavy and dead.

Idaho is attracting some attention and several wells are either drilling or preparing to resume in the eastern area near the Wyoming line.

NEW MEXICO

The Midwest Refining Co.'s No. 13 C. Farnsworth, SE NE NE Section 13-26-36, on the west side of the Jal District in southeastern Lea County New Mexico, came in this week as a gasser. It had 1,000,000 feet of gas at 3,030 feet and at 3,075-3,100 feet there was another flow making 20,000,000 feet. It probably will be completed as a gas well at this depth. It is 1¼ miles northeast of Cranfill & Reynold's No. 1 State, SE NE Section 23-26-36, which recently was abandoned; 1¼ miles west and a little north of the Marland No. 1 Eaves gasser, and 4 miles south of the Skelly Oil Co.'s Nok 1 Joyner, estimated good for 1,200 barrels. The elevation of the Farnsworth well is 2,959 feet. It topped the lime at 2,710 feet.

Lea County, southeastern New Mexico, had two disappointments this week in the Marland Production Co.'s No. 1 Warren, SE SW SW Section 28-20-38, in the Nadine district, and the same company's No. 1 Reed, NE cor. SW Section 22-20-36, in the San Simion district, both being abandoned. No. 1 Warren stopped drilling at 4,215 feet with a hole full of water at 4,207-15 feet. It had a little gas at 2,940 feet, and a show of oil at 4,140-44 feet. No. 1 Reed was drilled to 4,420 feet and had a hole full of sulphur water at 4,405-20 feet. It had an oil show at 3,740 feet and another at 4,315-25 feet, but neither of commercial value. The Marland's No. 1 Lockhart, NW NW Section 31-21-36, in the Eunice district, which has been attracting attention for several weeks, is still bottomed at 3,990 feet and cleaning out after being shot. The tankage has been filled and it was necessary to shut down until another 1,000-barrel tank could be erected for a short test. The hole at last reports had been cleaned to within 15 feet of the bottom and was making around 250 barrels a day. The Texas Production Co.'s No. 1 Moberly, SW NW NE Section 17-26-37, in the Jal district, which has been delayed at 3,540 feet for the past month by a fishing job, is being temporarily abandoned at that depth. The rig is being torn down. It was about 467 feet in the line.

Drilling in Lea County

Drilling wells in Lea County had little out of the routine in the way of news this week. The Midwest Refining Co.'s No. 19 Farnsworth, SW SW Section 12-26-37, on the east side of the Jal area, was shot again in an effort to loosen the tools which have been in the hole for several months, and drilling by is in progress at 3,890 feet. The Texas Production Co.'s No. 1 Shepherd, SE cor. NE Section 6-26-37, is still fishing at a total depth of 3,218 feet and has two bailers and a string of tools in the hole. In the meantime the well is averaging around 120 barrels of oil per day. The same company's No. 1 Lynch, NW cor. SE Section 34-20-34, topped the brown lime at 3,340 feet and the total depth is 3,376 feet. The 8¼-inch has been set and cemented on bottom. A new locatio nhas been made for No. 1 King, in the SE NE NE Section 26-25-32, by parties who expect to move on at once. The Midwest Refining Co.'s No. 31 Capps, SW cor. Section 3-19-38, in the Hobbs area, is spudding at 45 feet in hard sand. The Texas & Pacific Coal & Oil Co.'s No. 1 State, SE cor. SW Section 22-23-36, is bottomed at 3,331 feet and is preparing to bail and test. It had 2,000,000 feet of dry gas at 2,810-18 feet. Henderson, Dexter & Blair No. 1 Jewett and McDonald, SE cor. Section 18-20-34, topped the salt at 1,505 feet and is drilling at 1,775 feet in anhydrite. Cranfill & Reynolds' No. 1 Wilson, NW NE Section 23-25-36, is drilling at 2,760 feet in salt, and the Pubelo Oil Co.'s No. 1 Crosby, SW SW Section 29-25-37, set the 12½-inch at 940 feet in the red beds and is waiting for the cement to harden. The Gypsy Oil Co.'s No. 1 Mattern SW cor. SE Section 24-21-36, in the Eunice district, set the 10-inch at 3,000 feet. It topped the brown lime at 2,965 feet. The Vacuum Oil Co.'s No. 1 State, center west line, Section 13-17-34, set and cemented the 10-inch at 1,600 feet.

Eddy County Operations

In Eddy County, Flynn, Welch & Yates' No. 1 Jackson, C NE Section 13-17-30, northeast of the Artesia Pool and between that and the Caprock or Maljamar Pool, is bottomed at 3,560 feet and averaged 269 barrels a day for the past 10 days. The oil is being run to Artesia. It is doubtful if the well will be drilled any deeper at present. It is probable this new area will have a considerable play and several locations will be announced shortly. The nearest drilling well to the Jackson well is Lenoard & Levers' No. 1 Haggerty, NE cor. NW Section 18-16-30, 8 miles to the northwest, shut down at 2,476 feet for engine repairs. In the Artesia district, Eaton, and others' No. 1 Rich, (formerly the Brainard permit) NW cor. SE Section 29-17-27, is drilling at 1,705 feet in shale, and the Pecos Valley Gas Co., No. 4 Vandergriff, NW SE Section 5-17-28, is drilling at 300 feet in the red beds. R. D. Compton's No. 1-C Vandergriff, NE SE Section 1-17-27, is drilling at 2,055 feet in gray lime, and Flynn, Welsh & Yates' No. 56 State, Section 6-19-28, is shut down at 3,067 feet in brown lime. In the Twin Mounds district, southeast of the Artesia Pool, Sullivan & Randall's No. 1 State, NW cor. SW Section 19-20-30, is drilling at 1,160 feet in salt, and George F. Getty, Inc., No. 4 Dooley, SW NW Section 23-20-29, is drilling at 930 feet in white salt. Getty's No. 3 Bates and Martin, SE cor. SW Section 31-20-29, is drilling at 300 feet in red sand.

In Chaves County, L. B. Tannehill's No. 1 Butler, SE cor. Section 15-12-24, is bottomed at 850 feet in hard lime and fishing for tools, and Snowden & McSweeny's No. 1 Merchant, NW NW Section 27-15-23, is drilling at 4,210 feet in red shale and fighting cavy ground. R. T. Neal, and others' No. 1 Russell, NW NW Section 21-14-25, is bottomed at 1,382 and fishing for tools, and the Transcontinental-California Oil Co.'s No. 1 Robbins, SE cor. Section 1-14-28, is shut down at 1,005 feet in anhydrite for engine repairs. It had 1½ barrels of water at 850-60 feet.

In San Miguel County, the Pioneer Oil Co.'s No. 1 Montezuma, SE cor. NW Section 14-15-16, six miles south of Las Vegas, is drilling at 1,818 feet in red shale. In Roosevelt County, Sloan & Smith's No. 1 Lovern, C SE Section 4-3s-35, near Portales, is drilling at 700 feet in red rock.

Flynn, Welch & Yates' No. 1 Donahue, C NW NE Section 28-24-15, west of the Sacramento River in Otero County, is moving in for a 2,500-foot test. In Guadalupe County, Hanchett and others' No. 1 Rutherford, SW NE Section 24-8-24, is fishing for tools in a water sand at 2,210 feet.

In De Baca County, the Matador Oil Co.'s No. 1 Wood, SW SW Section 6-4n-20, Salada Creek structure, is drilling at 585 feet, and the Navajo Oil Co.'s No. 1 McAdoo, SW cor. NE Section 16-1s-27, Buffalo Creek, is drilling at 4,218 feet in hard brown lime. The Transcontinental-California Oil Co.'s No. 1 McWhorter, SW NW Section 6-3s-22, La Mora structure, is bottomed at 3,420 feet in shale and running the 6¼-inch at 3,380 feet.

San Juan County

In San Juan County, in the northwestern part of the state, the Milwaukee-New Mexico Syndicate's No. 1 Beardsley, C NE Section 30-28-11, in the Kutz Canon district, shut down for the winter, is drilling at 1,028 feet. The Angel Peak Oil Co.'s No. 1 Garland, NE NE Section 11-28-11, is drilling at 2,500 feet with the Mesa Verde sands as the next objectives. The Childers Drilling & Producing Co.'s No. 2, Section 24-31-16, on the Western Dome in the Ute Indian Reservation, is drilling below 2,102 feet at which depth the 6¼-inch was landed. The Continental Oil Co.'s No. 17 Santa Fe, Section 2-29-11, Rattlesnake Dome, is drilling at 6,557 feet in the lower Pennsylvania.

UTAH

Encouraging reports were received this week from the Phillips Petroleum Co.'s No. 1 Schick, C NE Section 16-27s-16, on the Barrier Creek structure in Wayne County, Utah, but owing to the remoteness of the operation and the roundabout way in which information comes, few of the details are available. It was reported to have had distinct odors of oil and gas at 4,750 feet when it topped a sand, and at 4,751 feet good shows of oil and gas are said to have been encountered. It is several hundred feet deeper than the surface geology indicated the Hermosa sand in the Pennsylvanian would be topped, but it is presumed the forma-

(Continued on Page 77)

REGENT WELL IN TURNER VALLEY BLOWING INTO LARGER PRODUCTION

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Mar. 23.—In the Turner Valley Field, southwest of Calgary, Regent Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, is in production in the deep lime at 3,870 feet, approximately 128 feet in the lime. The well has been put on the separator and a production test is being made. When this is finished, the test may be drilled deeper into the lime for larger production. The well started with a wet gas flow around 5,000,000 feet a day, with a potential crude naphtha recovery between 100 and 120 bbls., is apparently blowing itself into larger production. The test was finished under contract with a cable tool outfit by D. A. McDonald, after considerable trouble with a difficult fishing job, in the course of which it was necessary to blow a lost set of tools into the side of the hole. The location is on the same LSD as the McLeod Oil Co.'s wells, and somewhat to the south and east. It is reported Regent's No. 2 will be started as soon as No. 1 has been placed in steady production.

McLeod Oil Co.'s No. 4, LSD 16, Section 1-20-3w5, is drilling at 4,880 feet, approximately 1,140 feet below the top of the Madison limestone. The test has apparently encountered a new show of amber crude in this horizon. It blew 25 bbls. when the tools were removed. The gas is reported considerably wetter than in the upper horizons. The well got a big gas flow at 51 feet in the lime, but this was apparently a pocket, and soon blew itself out; since then the outfit has reached a far deeper geological horizon in the lime than any of the other Turner Valley tests. Recently, after changing to a gray formation with a smaller percentage of limestone, a formation similar to the dolomitic limestone again showed in the cuttings. An 8-inch hole is being drilled. The gas flow is reported around 4,000,000 feet.

Spooner Oils' No. 2, Section 24-20-3w5, diamond drill test, is drilling at 5,131 feet, about 61 feet in the lime, with somewhat increased shows of wet gas. The drilling indicates a very slight pitch in the lime structure. Spooner's No. 1, LSD 12, Section 13-20-3w5, is reported making 50 bbls. from the lime.

Information with regard to new development on the Dalhousie Oil Co. properties has just been made public by Imperial Oil Co., Ltd. Dalhousie's No. 7 will be started at once. Location has been made about 1,200 feet due south of Dalhousie's No. 5, which is in LSD 16, Section 30-19-2w5, in the south end of the field. Royalite Oil Co.'s No. 25 is being located in the south end of the field, 200 feet north and west of East Crest Oil Co.'s No. 1. Foothills Oil & Gas Co.'s No. 4 has been located in LSD 1, Section 26-20-3w5.

Royalite's No. 16 in Production

Drilling has been suspended at Royalite's No. 16, LSD 2, Section 12-20-3w5, in the Turner Valley Field, following a big strike of wet gas in the deep lime. As soon as the hole blows itself

(Continued on Page 129)

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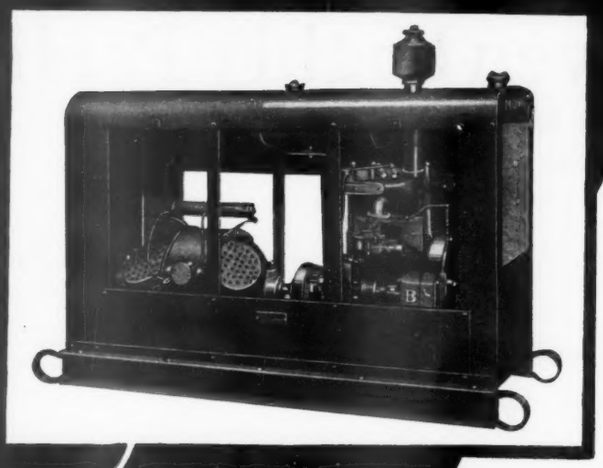

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O'Connell Zone Proven Highly Prolific

Universal Consolidated and Shell Get Two Good Wells From New Deep Horizon at Santa Fe Springs

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Mar. 25.—The second development cycle at Santa Fe Springs is already well under way following the recent unsuccessful attempt to retard or delay drilling operations and this deep zone exploitation is expected to become a factor of paramount importance within the next 60 days. It is almost impossible to venture an accurate opinion at this time as to when the next peak will be established at Santa Fe Springs due to the numerous variable factors involved. The high point to be reached is also subject to considerable variation depending upon the effectiveness of the projected curtailment program which is scheduled to go into effect on April 1 and whether one or more deep zones are developed simultaneously.

It is quite obvious that unrestricted development work would result in the attainment of an excessive abrupt peak, whereas selective drilling and regulated production would result in a prolonged period of a lesser but more consistent output. It looks like almost a foregone conclusion, however, that potential daily production at Santa Fe Springs will exceed 250,000 bbls., although it is quite likely that the actual daily output will be well below this figure due to artificial curtailment. Several wells have already tapped the recently discovered O'Connell zone, which is encountered at approximately 6,400 feet on top of the structure, and additional completions are expected in this horizon within the next few days.

Complete Two Large Wells

The completion of two large flowing wells within the past few days definitely removed any doubt which may have existed regarding the potentiality of the recently discovered O'Connell zone and confirms the opinion of all well informed oil men that deep zone exploitation at Santa Fe Springs represents one of the most threatening conditions which has confronted the California oil industry for several years. State production showed a very substantial drop last week due to the decline in flush production from the Nordstrum and Buckbee zones at Santa Fe Springs. This condition should not cause any false hopes as the two horizons which have been undergoing development in this field since last August are only an introduction of what is to come when the deep Miocene formation is drilled up. This is espeically important in view of the fact that geologic conditions are favorable for substantial accumulations of oil down to a depth of at least 8,000 feet.

The Nordstrum and Buckbee sands which have caused the substantial increase in production during the past several months are of Pliocene age, which in the geologic column immediately overlies the Miocene formation which proved so highly prolific at Long Beach.

The two wells which definitely proved up the deep O'Connell zone as highly prolific were the Universal Consolidated's No. 7 Blanchard and the Shell Oil Co.'s No. 1-B Slusher. The former blew in flowing 8,100 bbls. of absolutely clean 35 gravity oil and approximately 2,000,000 feet of saturated gas daily from 6,712 feet. The Shell's new well came in doing 2,940 bbls. of clean pipe line oil daily from only 6 feet of oil sand.

May Test Deeper Sands

A check of development work under way at the present time indicates the probability that other horizons below the O'Connell zone are also scheduled for early development. So far this deep zone exploitation of the Clarke and other horizons below the O'Connell zone has been limited to areas around the edge of the field where operators failed to find the Nordstrum or Buckbee sands. This Miocene development will ultimately be extended to the top of the structure, however, but will probably not reach the

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well, location—	S	T	R	Depth	Status—
Standard, No. 5-9, Saticoy, Ventura Co.	10-	2-	22	6,104	gr. sd. drilling
California Western Oil Co., No. 1 Elkins, Ventura Co	28-	4-	19	2,951	suspended
Exline, Emma, No. 1 Saticoy, Ventura Co.	33-	3-	21	2,412	abandoned
American Oil Co., No. 1 Camarillo, Ventura Co.	33-	2-	20	946	hd. sd. drilling
Star Pet. Co., No. 2 Canet, Ventura Co.	13-	3-	23	6,775	suspended
Bolsa Chica, No. 1 Temescal, Ventura Co.	4-	4-	18	769	br. sh. drilling
The Texas Co., No. 1 Hueneme, Ventura Co.	Lot	82		425	sd. drilling
The Texas Co., No. 1 Wiley Canyon, Ventura Co.	2-	3-	19	116	sd. drilling
Miley, E. J., No. 2 Casitas, Ventura Co.	12-	3-	21	940	rd. sd. drilling
Shell, No. 1 Simi, Ventura Co.	31-	3-	17	2,350	hd. sd. drilling
Continental, No. 1 Sulphur Mountain, Ventura Co.	21-	4-	22	3,754	reaming
Continental, No. 2 Sulphur Mountain, Ventura Co.	22-	4-	22	6,114	br. sh. drilling
Milham Expltn., No. 1-A Buttonwillow, Kern Co.	8-	28-	23	4,662	gas well
Milham Expltn., No. 2 Buttonwillow, Kern Co.	8-	28-	23	2,730	gas well
Milham Expltn., No. 3 Buttonwillow, Kern Co.	8-	28-	23	2,694	gas well
Milham Expltn., No. 4 Buttonwillow, Kern Co.	6-	28-	23	2,670	gas well
Milham Expltn., No. 5 Buttonwillow, Kern Co	6-	28-	23	2,500	gas well
Milham Expltn., No. 6 Buttonwillow, Kern Co.	8-	28-	23	2,676	gas well
Milham Expltn., No. 7 Buttonwillow, Kern Co.	6-	28-	23	2,720	suspended
Milham Expltn., No. 8-A Buttonwillow, Kern Co.	8-	28-	23	2,673	gas well
Doheny-Stone, No. 1 Salisbury, Kern Co.	7-	29-	24	4,750	cemented
South. Cal. Gas Co., No. 1 Buttonwillow, Kern Co.	4-	28-	23	4,272	suspended
South. Cal. Gas Co., No. 2 Buttonwillow, Kern Co.	27-	28-	23	Rig	suspended
Lincoln Drlg. Co., No. 1 Buttonwillow, Kern Co.	6-	28-	23	190	suspended
Richfield Oil Co., No. 1 Semitropic, Kern Co.	21-	26-	22	5,207	plug back
Richfield Oil Co., No. 2 Semitropic, Kern Co.	36-	27-	23	4,013	br. sh. drilling
Pacific Eastern, No. 1 Union Ave., Kern Co.	6-	30-	28	5,640	suspended
Pacific Eastern, No. 2 Union Ave., Kern Co.	6-	30-	28	4,500	suspended
Pacific Eastern, No. 3 Union Ave., Kern Co.	6-	30-	28	4,443	gas shut in
Pacific Eastern, No. 5 Union Ave., Kern Co.	5-	30-	28	4,991	suspended
Stabler, W. W., No. 1 Commanche Point, Kern Co.	23-	32-	29	3,409	suspended
Symark Oil Co., No. 1 Edison, Kern Co.	24-	29-	29	1,230	install rotary
Midway Northern, No. 1 Edison, Kern Co.	29-	29-	30	3,841	suspended
Elmer Oil Co., No. 1 Shafter, Kern Co.	8-	28-	25	6,100	suspended
Elmer Oil Co., No. 1 Edna, Kern Co.	15-	30-	30	1,014	rigging up
Elmer Oil Co., No. 1 Rosedale, Kern Co.	33-	29-	26	Rig	rigging up
Shell Oil Co., No. 1 Lerdo, Kern Co.	5-	29-	27	Mtl.	building rig
General Pet., No. 1 McFarland, Kern Co.	25-	26-	25	.....	location
Union No. 2 San Emidio, Kern Co.	5-	10-	21	1,906	bl. sh. drilling
Currency Pet. Co., No. 1 Vineyard, Fresno Co.	28-	21-	14	1,495	gr. sh. drilling
Currency Pet. Co., No. 2 Vineyard, Fresno Co.	14-	21-	14	Mtl.	building rig
Hornaday & Huggins, No. 1 Kerman, Fresno Co.	32-	14-	18	2,088	sd. sh. drilling
K. C. L. Oil Co., No. 1 Joaquin Ridge, Fresno Co.	7-	19-	15	114	suspended
Thomas Pet. Co., No. 1 Krayenhagen, Fresno Co.	33-	22-	17	568	br. sh. drilling
Union, No. 1 Huasna, San Luis Obispo Co.	34-	32-	15	3,232	redrilling
Union, No. 1 North Huasna, San Luis Obispo Co.	12-	32-	14	2,968	redrilling
Panorama Oil Co., Well No. 1, San Luis Obispo Co.	7-	31-	21	3,600	pipe bad
Dollar Oil Co., No. 1 Vishnu, San Luis Obispo Co.	18-	32-	22	1,788	suspended
Shell, No. 1 Guadalupe, Santa Barbara Co.	36-	10-	35	2,515	cemented
Shell, No. 2 Guadalupe, Santa Barbara Co.	25-	10-	35	Mtl.	building rig
Shell, No. 2 Goleta, Santa Barbara Co.	36-	5-	31	2,475	fishing
Standard, No. 1 Point Conception, Santa Barbara Co.	X-	5-	34	1,462	sd. sh. drilling
Standard, No. 1 Tortuga Canyon, Santa Barbara Co.	.....			1,677	sd. sh. drilling
Standard, No. 1 Point Arguello, Santa Barbara Co.	X-	7-	35	.....	location
Olympic Oil & Rel. Co., No. 1 Mesa, Santa Barbara Co.	X-	7-	28	1,014	sd. sh. drilling
Bankline Oil Co., No. 1 Mesa, Santa Barbara Co.	X-	4-	27	3,478	gr. sh. drilling
Exeter Oil Co., No. 1 Mesa, Santa Barbara Co.	X-	4-	27	1,397	sd. sh. drilling
American Oil Co., No. 1 Summerland, Santa Barbara Co.	X-	4-	26	155	sd. drilling
Nevada Standard, No. 1 Goleta, Santa Barbara Co.	10-	4-	28	1,564	sd. sh. drilling
General Pet., No. 1 Elwood, Santa Barbara Co.	21-	4-	28	.....	location
Padre Oil Co., No. 1 Dos Pueblos, Santa Barbara Co.	18-	4-	27	799	sd. drilling
System Oil Co., No. 1 Orcutt, Santa Barbara Co.	36-	10-	34	246	suspended
Tepesquit Oil Co., Well No. 1, Santa Barbara Co.	3-	9-	32	2,710	suspended
Becker, Geo F., No. 1 Summerland, Santa Barbara Co.	33-	4-	25	3,090	suspended
Channel Oil Co., Well No. 1, Santa Barbara Co.	29-	4-	27	6,304	suspended
Channel Oil Co., No. 1 Fellowship, Santa Barbara Co.	29-	4-	27	Rig	rigging up
Continental, No. 1 Carpenteria, Santa Barbara Co.	33-	4-	25	3,990	cleaning out
Elwood Consd., No. 1 Goleta, Santa Barbara Co.	8-	4-	29	3,310	wet
Colusa Oil Co., Well No. 1, Colusa Co.	31-	15-	4	380	redrilling
Nuna Oil Co., Well No. 1, Colusa Co.	19-	15-	5	400	suspended
North Counties Oil Co., Well No. 2, Humboldt Co.	36-	2-	1	2,205	suspended
Humboldt Oil Co., Well No. 1, Humboldt Co.	6-	2-	1	3,041	redrilling
Applegate & Renshaw, Well No. 1, Merced Co.	24-	6-	10	2,820	bl. sh. drilling
Angiola Oil Co., No. 1 Angiola, Tulare Co.	27-	22-	23	5,491	hd. sd. drilling
Calhoma Oil Co., No. 1 Livermore, Alameda Co.	9-	3-	3	1,544	cleaning
Foster & Hammill, Well No. 1, Alameda Co.	21-	3-	3	465	suspended
R. Y. Hanlyn, Well No. 1, Alameda Co.	3-	5-	2	360	suspended
Shell, No. 1 Dudley, Monterey Co.	15-	22-	9	1,216	hd. sd. drilling
Brown Oil Co., No. 1 Parkfield, Monterey Co.	.....			.....	grading
Dudley Ridge Synd., No. 1 Tulare, Kings Co.	12-	23-	19	1,298	little show

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

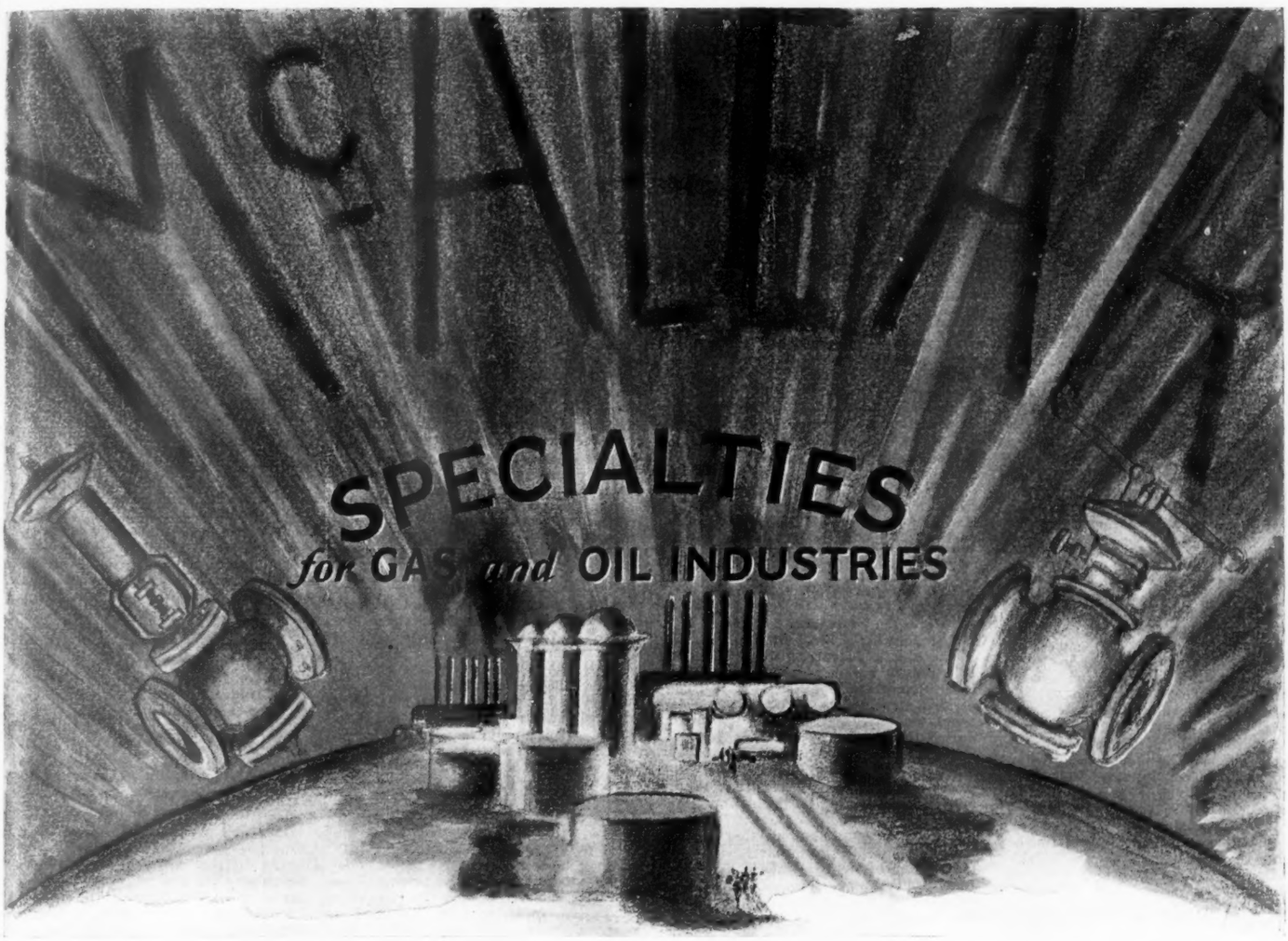
Pray, Max, No. 1 Inglewood, Los Angeles Co.	34-	2-	14	Mtl.	building rig
Ring Pet. Co., No. 1 Inglewood, Los Angeles Co.	28-	2-	14	4,704	cleaning out
Ohio Oil Co., No. 1 Playa Del Rey, Los Angeles Co.	22-	2-	15	Rig	rigging up
Petroleum Securities, No. 1 Hermosa, Los Angeles Co.	32-	3-	14	3,940	cemented
Western Drlg. Co., No. 1 Manhattan, Los Angeles Co.	30-	3-	14	3,916	sd. sh. drilling
Standard, No. 1 Hawthorne, Los Angeles Co.	5-	3-	14	Mtl.	building rig
Mont. Park Pet. Co., No. 1 Jepson, Monterey Park	25-	1-	12	3,937	suspended
Rio Grande, No. 1 Downey, Los Angeles Co.	34-	2-	12	4,714	hd. sd. drilling
Jackson, R. W., No. 1 Whittier, Los Angeles Co.	19-	2-	11	593	hd. sd. drilling
Burlingham Pet. Co., No. 1 Compton, Los Angeles Co.	17-	3-	13	494	suspended
Richfield, No. 1 Maywood, Los Angeles Co.	13-	2-	13	5,408	sd. sh. drilling
Easton & Smith, No. 1 Calabasas, Los Angeles Co.	19-	1-	17	2,982	suspended
Russell Oil Co., No. 2 Joughin, Los Angeles Co.	25-	3-	17	1,550	hd. sd. drilling
Pomona Oil Co., Well No. 1, Los Angeles Co.	32-	1-	8	1,090	fishing
Anchor Oil Co., No. 1 Puente, Los Angeles Co.	19-	2-	10	4,820	suspended
Richfield Oil Co., No. 1 Puente, Los Angeles Co.	9-	2-	10	3,862	gr. sd. drilling
Union Oil Co., No. 1 Richfield, Los Angeles Co.	13-	3-	9	.....	grading
Southwestern Dev. Co., No. 1 Richfield, Los Angeles Co.	21-	3-	9	1,811	sd. sh. drilling
Calif. Eastern, No. 1 Wickham, Los Angeles Co.	32-	5-	17	3,098	plug. back
Coastline Oil Co., No. 1 Devil Canyon, Los Angeles Co.	21-	5-	17	486	sd. drilling
The Texas Co., No. 1 Anaheim, Orange Co.	35-	4-	10	4,812	hd. sd. drilling
Mesa Pet., No. 1 Newport, Orange Co.	21-	6-	10	3,799	br. sh. drilling
West. Drlg. & Prod. Co., No. 1 Newport, Orange Co.	18-	6-	10	4,464	suspended
West. Drlg. & Prod. Co., No. 2 Newport, Orange Co.	18-	6-	10	Rig	suspended
Hall Pet. Co., No. 1 Murrietta, Riverside Co.	22-	7-	3	975	suspended
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9-	5-	1	3,232	set pipe
Davenport Oil & Gas Co., No. 1 San Marcos, San Diego Co.	30-	12-	8	847	suspended
Turner, S. S., No. 1 Escondido, San Diego Co.	25-	12-	2	1,785	br. sh. drilling

competitive stage for several months at conservative drilling contemplates the development of maximum production from the O'Connell zone before progressing to other deeper virgin horizons. As the situation stands at the present time, deep zone exploitation is expected to become an important factor in field production at Santa Fe Springs within the next 30 or 60 days. This work will result in the establishment of a second 1929 production peak with the sky as a limit unless proposed curtailment measures retard production in conformity with the recommendation of the Pacific Coast Regional Committee of the American Petroleum Institute. There is no definite basis for assuming the development of substantial production at Santa Fe Springs as a result of projected deep zone development in view of the small output shown by the first two completions but personal observation leads me to believe that we may anticipate the ultimate completion of many large wells which might result in a partial repetition of the chaotic conditions which existed in 1923 if development work were permitted to continue unabated. It is a foregone conclusion, however, that conservation work will be undertaken in California in the near future with the result that crude oil production will be kept within reasonable bounds.

The Continental Oil Co.'s No. 1 Franklin, a wildcat, located at Carpenteria in Santa Barbara County, has not yet been given a conclusive production test due to extreme gas pressure and this well consequently continues to be the most promising wildcat under way at the present time. The pressure in this wildcat is so great that the company has been obliged to replace the rotary drilling mud with almost pure baroid. It is the present intention to drill ahead some 25 or 30 feet if possible and bring the well in through the drill pipe in order to eliminate any unnecessary delay and at the same time reduce the possibility of disaster. This well is located in close proximity to both the Pacific Ocean and the Southern Pacific Railroad tracks and for this reason extreme care must be exercised in order to prevent a premature blowout as this would disrupt railroad transportation and might cause considerable damage if any great quantity of oil should be blown out into the ocean. The Elwood Consolidated Oil Co. made a test of its No. 1 Cavalletto, a wildcat located approximately 2 miles northeast of the Elwood Field of Santa Barbara County, but an unsuccessful water shutoff prevented the determination of this well's potentiality. A rather heavy gas was encountered during the course of work and this, together with core samples revealing 12 feet of oil sand in the bottom of the hole, led to the assumption that a new field might possibly be opened up. There is a diversity of opinion, however, as to whether this structure will prove a repetition of E. J. Miley's experiences on the near-by Tecolote anticline, or whether it will result in substantial sustained production.

May Refine Own Crude

The Standard Oil Co. cut the price of Elwood crude 24 cents per barrel during the early part of the past week, and while this downward revision, effective March 18, is quite a substantial one, it was not totally unexpected as the consistent substantial production built up by the Barnsdall and Rio Grande has diverted several tankers from other shipping lanes and may later lead to the chartering of additional bottoms. Current production at Elwood approximates 29,000 bbls. per day and with no pipe line facilities available it is quite obvious that at least two tankers are constantly re



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quired to move this production to refining centers. Roughly, the tanker haul from the Elwood Field of Santa Barbara County to Los Angeles or San Francisco approximates 15 cents per barrel. The cut of 24 cents per barrel in crude oil prices represents an aggregate reduction of approximately $7,000 per day or a decrease in revenue of about $3,500 each for both the Barnsdall and Rio Grande. The latter company is putting the finishing touches on its augmented pipe line facilities in Southern California and a large part of this reduction in price will be offset by increased refining profits when the company starts utilizing Elwood crude in its Vinvale refinery. The Rio Grande is not yet in a position to use any considerable quantity of Elwood crude as the railroad haul from Santa Barbara to its Vinvale refinery near Los Angeles is practically prohibitive. As a consequence, the Barnsdall and Rio Grande have disposed of their current production in the open market. It is quite probable, however, that the Rio Grande will be utilizing Elwood crude in its refining operations along around the latter part of April or the first of May as the new marine loading wharf at Los Angeles harbor and new pipe line facilities are rapidly nearing completion.

Santa Fe Springs

Completions in the Santa Fe Springs Field of Los Angeles Basin have been below normal for the past several weeks and while the number of completions in the Nordstrum and Buckbee horizon will continue to become less frequent as time goes on, deeper drilling will soon be reflected in both production and development reports. The Shell has just finished another producer in the recently discovered O'Connell horizon and this project, the second producer to be finished in this zone, come in under natural flow doing 2,940 bbls. initially from 6,552 feet. The Shell's new well is No. 1-B Slusher, located in the western part of the field approximately 900 feet from the four corners. The best well finished during the past week was the Wilshire Oil Co.'s No. 2 Eagle, which was completed in the intermediate Nordstrum zone at 5,290 feet. It registered an initial of 4,460 bbls. of clean 34.9 gravity oil and 2,400,000 feet of wet gas daily. No. 152-D Santa Fe of the General Petroleum was also a satisfactory completion as this new well tanked 3,280 bbls. of clean 34.6 gravity oil per day from the deep Buckbee horizon at 5,878 feet. The Union completed its No. 10 Alexander several days ago and while it failed to show clean production upon completion it is nevertheless a satisfactory producer as the water is being removed with the aid of a water trap. This well, which was carried down into the Buckbee horizon and finished at 6,136 feet, is producing 2,800 bbls. of fluid, approximately 26 per cent of which is water. The Pandini Petroleum Co. recompleted No. 7 Off flowing 2,215 bbls. of exceptionally clean 34.9 gravity oil daily after redrilling and deepening it to the Buckbee horizon at 5,880 feet. The Universal Consolidated's No. 11 Blanchard proved somewhat of a disappointment upon completion in the Buckbee zone a few days ago as it only registered an initial of 688 bbls. daily from 5,778 feet. O. C. Marsten successfully finished his No. 2 Santa Fe in the intermediate Nordstrum zone during the early part of the week and this new well tanked 1,140 bbls. of clean 34.7 gravity oil daily from an even 5,300 feet. Marsten's No. 1, incidentally, failed to effect a satisfactory water shut off at 5,590 feet and will require additional work before being passed for production.

Long Beach

One of the most interesting completions in the Long Beach Field during the past week was E. L. Doheny's No. 1 Nelson, which blew in flowing 1,225 bbls. daily during the course of a water test being made from 6,317 feet. This well, which is located in the extreme southwestern part of the field, is an offset to Warren & MacCrate's No. 1 Dugan, which came in a few weeks ago flowing 1 895 bbls. per day from 6,771 feet. It is also located in close proximity to the Union Oil Co.'s No. 1 Malin, which is drilling ahead in the oil sand at 6,950 feet and should be tanking oil shortly. The Delaney Petroleum Co. recompleted No. 1 Bauter several days ago after redrilling and deepening it to 6,940 feet and this rejuvenated well was returned to production flowing 1,170 bbls. of clean 29.4 gravity oil daily. The Shell chalked up two new wells at Long Beach this week, No. 11 Jones showing an initial of 740 bbls. daily from 7,066 feet and No. 4 Horsch 370 bbls. from an even 7,400 feet. The Cypress Petroleum successfully recompleted No. 5 Crest, after redrilling and deepening it from 5,395 feet to 5,788 feet, and it was returned to production flowing 495 bbls. of unusually clean 30.1 gravity oil daily. The largest well finished at Long Beach during the current week was No. 24 Municipal of the A. T. Jergins Trust as it came in under a natural flow making 2,990 bbls. of clean 30.1 gravity oil daily from 7,898 feet, the hole having been finished with a 6⅝-inch oil string carrying 1,436 feet of perforated. This well, together with Nos. 5 and 25, two other immediate potential producers, is located on municipally owned acreage which was leased by the city of Long Beach five or six years ago on a 30 per cent royalty basis. This new well is therefore producing a revenue for the municipality in excess of $1,000 per day, especially since the royalty oil brings a premium over the posted price.

Lawndale

The Lawndale Field of Los Angeles Basin is still an enigma and will probably remain an unknown factor for another several weeks. The extent and trend of this structure has not yet been determined although drilling operations during the next 30 days will throw considerable light on existing subsurface conditions. The Pacific Western Oil Co. successfully finished its No. 2 Howland a few days ago doing 1,600 bbls. of clean pipe line oil daily from 5,828 feet and while this substantial production has relieved the tension somewhat it does not materially change the outlook as far as the town lot area is concerned as it is located on acreage within a few hundred feet of the discovery and is a direct offset to the initial completion. The Standard stands an excellent chance of securing commercial production in its No. 1 Vance, located in the town lot area east of the discovery well, but the outcome will not be definitely known for another few days. The utter lack of uniformity in subsurface conditions is causing operators considerable anxiety and it is a foregone conclusion that extensive losses will be sustained by many operators. At least $5,000,000 has already been expended in development work and the continuance of present intensive development is merely throwing another dollar away in an effort to recover two already gone. There are quite a number of holes in the Lawndale area considerably deeper than the depth at which production was secured in the discovery well and for this reason it might be a wise policy for many operators to temporarily suspend drilling pending further developments. The situation at Lawndale is quite similar in many respects to that which existed a few years ago at Potrero shortly after the Associated made its original discovery. It will be recalled that the Associated's first well at Potrero failed to result in commercial production due to water trouble and the first commercial producer was not brought in until several months later. The initial showing encountered by the Associated was sufficient encouragement to induce a number of operators to immediately undertake development work with the result that there were at one time 10 or 15 wells drilling before even a single barrel of oil had been brought to the surface. The drilling was predicated upon the gas showing and core samples removed from the Associated's first wildcat which failed to result in commercial production in either the upper or lower horizon as it was located off structure. It is needless to say that all of the wells started around the edge of the field at that time were ultimately abandoned. This work led to the assumption that the Associated controlled the entire amount of productive acreage and Potrero remained quiet for a long time. Jim Pollard and the California Eastern Oil Co. have recently disproved this theory, however, as their outpost has opened up the town lot area for development by showing an initial flow of 500 bbls. daily on a preliminary production test. Several additional projects are expected to get under way in the town lot area northwest of the Associated's holdings in the near future, as five new locations have been staked within the past few days. This section of the field should be developed with the utmost care as it appears quite treacherous. Subsequent drilling may alter the situation but all development work up to the present time indicates conclusively that this field cannot sustain intensive town lot development.

Seal Beach

Two wells were put on production in the Seal Beach Field of the Los Angeles Basin during the past week, one of which was a recompletion. This was No. 12 San Gabriel of the Standard Oil Co. which was returned to production a few days ago flowing 1,650 bbls. of clean 25.9 gravity oil initially from 5,451 feet. The Standard has several other potential producers under way in this field at the present time and will probably complete another new well within the next 10 days. The Marland Oil Co. finished No. 27 Bixby, a new well during the latter part of the current week, and this project came in flowing 1,075 bbls. daily from the Bixby zone at 4,758 feet. The Marland, like the Standard also has several new wells nearing completion, one of which, No. 6 Bixby, should be tanking oil in the near future. There were no developments of unusual importance in either the Rosecrans, Brea Olinda, Dominguez, Huntington Beach, Montebello or Richfield districts during the past week. Only a relatively limited amount of drilling is under way in these areas and consequently new wells are only completed at infrequent intervals. There are three or four projects nearing completion in these various fields and it is quite likely that they will be tanking oil within the next few weeks.

Ventura Avenue

Two new wells were completed in the prolific Ventura Avenue Field during the past seven-day period but neither of them, however, was of unusual significance. Both of these new producers, No. 27 Taylor and No. 25 Edison, were finished by the Shell Oil Co. The former tanked 1,040 bbls. during the initial 24-hour test from 6,693 feet, while the latter came in flowing 650 bbls. daily from 7,053 feet. Completions in the Ventura Avenue Field during the past several weeks have been a little more numerous than heretofore with the result that field production has shown a slight increase. There are 52 strings of tools in operation at the present time and a check of individual wells reveals the probable completion of perhaps 10 or 15 new producers during the course of the next 30 days. The Associated and Shell are both maintaining a consistent development program and each has at least five wells rotating ahead in the oil sand at the present time. The Pacific Western and the M.K&T. Oil Co. should also chalk up at least one new well during the next few weeks.

Midway-Sunset

Two new wells were finished in the Midway-Sunset Field of Kern County during the past week, one of them showing substantial production. This was the Chanslor-Canfield Midway Oil Co.'s No. 5 in Section 7-32-23, which showed an initial daily production of 748 bbls. from the Republic sand at 3,150 feet. The Standard's No. 15 in Section 29-31-24, was somewhat smaller as it only registered an initial of 145 bbls. daily. The Fruitvale Field of Kern County also yielded a new well during the past week when the Mohawk Petroleum Co.'s No. 3 was given a production test at 4,160 feet. This new well tanked 728 bbls. of relatively clean 22.1 gravity oil daily but will undoubtedly be pinched in or closed down entirely as there is no market for this unrefinable crude. The Pacific Eastern Production Co., discoverer of the Fruitvale Field, has staked a location for a new well in Section 26-29-27, and drilling will undoubtedly get under way in the near future. The significance of this new well lies in the fact that it is an outpost considerably beyond production in the southeast part of the field. Drilling operations in the Kern River Field of Kern County have been at a standstill during the past several weeks and operators are only fulfilling lease obligations. This work resulted in the completion of one new well during the past week as The Texas Company finished No. 5 Midland as a 165-bbl. pumper from 2,030 feet. This well, like other recent completions, was shut in after being finished due to the inability of operators to handle any increased production of heavy oil.

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	77,950	11,136	61,825	8,832	250,325	1,515,949
Fuel oil	49,950	7,136	....	....	49,950	.....
Diesel and gas oil	102,562	14,652	91,375	13,054	583,503	449,739
Gasoline	370,970	52,996	700,016	100,002	4,752,940	2,428,295
Naphtha distillate	.....	.....	.....	.....	81,750	.....
Coastwise—						
Crude oil	466,102	66,586	762,029	108,761	6,535,453	4,279,258
Fuel oil	244,626	34,947	265,334	52,191	4,789,016	4,395,860
Diesel and gas oil	64,732	9,247	7,525	1,075	264,135	330,704
Gasoline	220,422	31,489	174,752	24,965	2,577,980	2,906,826
Kerosene	.....	.....	.....	.....	3,313	22,865
Naphtha distillate	.....	.....	.....	.....	.....	171,566
Exports—						
Crude oil	119,813	17,116	3,700	529	1,052,426	524,183
Fuel oil	569,308	81,330	135,078	19,298	4,224,089	6,199,100
Diesel and gas oil	127,585	18,226	.....	.....	640,584	637,286
Gasoline	223,360	31,909	202,157	28,880	2,139,861	1,058,733
Kerosene	.....	.....	47,660	6,809	597,211	1,209,237

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Crude oil	.....	.....	.....	.....	.....	.....
Fuel oil	.....	.....	.....	.....	.....	.....
Diesel and gas oil	.....	.....	.....	.....	.....	342,425
Gasoline	113,480	16,211	.....	.....	690,164	410,466
Kerosene	.....	.....	.....	.....	.....	.....
Lubricants	.....	.....	.....	.....	.....	138,769
Coastwise—						
Fuel oil	63,951	9,136	.....	.....	688,531	898,510
Diesel and gas oil	.....	.....	74,977	10,711	182,724	86,519
Gasoline	21,315	3,045	81,417	11,631	755,308	780,657
Kerosene	2,511	359	5,141	734	27,181	68,321
Exports—						
Crude oil	.....	.....	.....	.....	71,453	45,102
Fuel oil	.....	.....	.....	.....	96,351	533,062
Diesel and gas oil	1,523	218	.....	.....	64,338	10,400
Gasoline	343,334	49,048	44,540	6,363	1,312,637	1,140,665
Kerosene	5,680	811	.....	.....	75,138	282,102
Lubricants	.....	.....	.....	.....	13,693	.....

MARLAND'S NEW COMPANY

E. W. Marland, C. C. Brown and Alex W. McCoy, all former officials of the Marland Oil Co., and others, have been granted a charter under the laws of the State of Delaware for an oil company which will for the present be known as the Ponca City Oil Co. It is expected the name will be changed at the annual meeting on March 23. The company starts with a capital of 5,000,000 shares of no par value. Its headquarters will be in Ponca City, Okla.

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New Work Starting in Eastern Fields

More Completions in West Virginia and Southeast Ohio but No Large Wells. Weather Delaying Work

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Mar. 25.—More wells than usual were completed in the West Virginia and southeast Ohio fields, but neither had any large wells. There is considerable new work starting and there will be more when the weather settles. So far it has been most unfavorable and the roads are in a bad condition, making it almost impossible to get material to the fields. Interest in field work will not be revived until more is known of the prospective developments in Washington County, Pennsylvania and Ravenwood district, Jackson County, West Virginia. Development work has not progressed far enough in either locality to indicate the ultimate results.

The Pennsylvania grade has been holding firm since the first of the year. The increasing demand for this grade is the most encouraging feature to the eastern producer. With the return of spring and summer it is expected the demand will be greatly increased. To meet this demand the old fields will be more closely developed as the chances for new producing territory have been greatly reduced.

WEST VIRGINIA

In Henry district, Clay County, the South Penn Oil Co. has completed in the Big Injun sand No. 6 on the James Phillips farm, good for 10 bbls. In the same district and county, the Virginian Gasoline & Oil Co. completed in the same formation No. 21 on the Brown, Swan, Goshorn & Sinnett tract, estimated good for 10 bbls.

In DeKalb district, Gilmer County, the Hope Construction & Refining Co. has completed No. 5 on the Drusilla Hardman farm in the Blue Monday sand. It was formerly a producer in the Maxon sand and is now a light pumper in the lower formation. On McFarlan Creek, Murphy district, Ritchie County, the same company drilled its test on the Anna M. Wilson farm through the Berea grit. It is a duster.

In McElroy district, Tyler County, the Alvy Oil & Gas Co. drilled deeper No. 4 on the W. R. McIntyre farm. It is good for 4 bbls. in the Gordon sand. In Troy district, Gilmer County, C. M. Bennett & Co. completed in the Big Injun sand a second test on the H. B. Keister farm. It is a gasser.

Roane County

In Geary district, Roane County, the United Carbon Co. has a gasser in the salt sand on the E. R. Conley farm. In the same district, the Hollywood Oil & Gas Co. has a salt sand gasser on the George White farm. The same company is rigging up on the T. F. Smith farm. The United Fuel Gas Co.'s No. 2,543 on the Brown, Swan & Goshorn tract, is a gasser in the Big Injun sand. In Smithfield district, the same company's No. 2,574 on the William Shaffer & Co.'s farm is a gasser in the same formation.

On the Ridge, one-half mile west of McFarlan Station, Murphy district, Ritchie County, the Southern Oil Co.'s second test on the Lynch heirs' farm completed in the Big Injun sand and reported a light pumper failed to make a profitable producer and has been abandoned. On Mayberry Run, same district, H. Satterfield has completed through the same formation a test on the J. Maxwell farm. It is also a duster. In Geary district, Roane County, the South Penn Oil Co. has the rig completed for another well on the Kate H. Nixon farm.

In Clay district, Wetzel County, the Littleton Oil & Gas Trust Co. has completed in the Gordon sand a test on the Wade-Cain farm which flowed 50 bbls. the first 24 hours. This is the largest producer completed in West Virginia in months.

In Liberty district, Marshall County, Hinerman, Reid & Co. have a duster in the Gordon sand on the H. W. Ernest farm. In Clay district, Monongalia County, J. A. Phillips & Co. have a Fifth sand gasser on the Titus Lemley farm.

In Duval district, Lincoln County, the United Fuel Gas Co.'s No. 1,978 on the Horse Creek Land & Mining Co.'s tract is a gasser in the Big Injun sand. In Jefferson district, the same company has completed No. 2,557 on the Gilbert Adkins farm. It is a gasser in the Big Injun sand. In the same district, Earl Cameron has a gasser in the Berea grit at No. 3 on the J. A. Stone farm.

For the first time in months, Upshur County, Buchanan district, reports a completion. It is the Cumberland & Allegany Gas Co.'s second test on the Gould heirs' farm, an old well drilled to a total depth of 3,957 feet. It is a gasser. In Meade district, Tyler County, the American Oil Co.'s test on the John McCoy farm is a light gasser in the Big Injun sand.

Marion County

In Mannington district, Marion County, J. J. Allen has a gasser in the Big Injun sand on the S. C. Thorn farm.

In Center district, Gilmer County, the Hope Natural Gas Co.'s old No. 5,807 on the S. Tallhamer farm is a gasser in the Big Injun sand. In Washington district, Calhoun County, the same company's No. 7,236 on the William Lamb farm is a gasser in the Salt sand. In Center district, L. F. Bickel's second test on the M. Hamilton farm is a gasser in the Maxon sand. In the same district, the Steer Creek Oil & Gas Co. has a gasser in the Big Injun sand on the A. H. Stump farm. In Lee district, F. F. McIntosh has a gasser at a second test on the J. M. Morgan heirs' farm. In Jefferson district, Lincoln County, the Cecelia Oil & Gas Co. has a Big Injun sand gasser on the Croft Land Co.'s tract.

Drilling Test Wells

In Church district, Wetzel County, the Pure Oil Co. has started to drill on the W. C. Cole farm. In Meade district, Marshall County, the Valley Gas Co. is due in the Big Injun sand on the George Yoho farm. In Grant district, Cabell County, the Harshbarger Oil & Gas Co. has rig material at a location on the G. A. Rogers farm. In Chapmanville district, Logan County, the Hope Natural Gas Co. has the road made to a location on the Frank Barker farm. In Hackers Creek district, Lewis County, the Standard Gas Co. is due in the Big Injun sand on the Wade Dennison farm. In the same district, Fred Fletcher is drilling a second test on the Bento A. Smith farm.

Lincoln County

In Carroll district, Loncoln County, the United Fuel Gas Co. has placed a drilling machine on the Emily S. Bias farm. In Jefferson district, the Hope Natural Gas Co. has made locations on the Sylvester and Julia Adkins farms. In Jefferson district, the Cambridge Gas Co. is building a rig on the Julia Hill farm.

On Laurel Run, Murphy district, Ritchie County, E. E. Pope has a rig completed for No. 5 on the H. S. and R. Wilson farm. On the left fork of Dutchman Run, same district, the South Penn Oil Co. has the rig up for No. 11 on the Haught Lambert farm. On Whitewood Run, Grant district, the Burk Oil & Gas Co. has spudded in at No. 104 on the H. Mount tract. On Straight Creek, Burning Springs district, Wirt County, R. C. Waggener and others have a rig completed on the William Lievings farm. In Jefferson district, Pleasants County, Dinsmoor & Co. have started to drill No. 5 on the A. Pentzelman farm.

Calhoun County

In Lee district, Calhoun County, the Hope Natural Gas Co. has a rig completed on the Addie Gainer farm. In the same district the same company has a rig completed on the Dee Nitz farm. In Sheridan district, the Hope Natural Gas Co. has a rig up on the T. S. Cunningham farm. On Rich Creek, Big Sandy district, Kanawha County, the Brawley Oil Co. has a rig completed on the Frank Rose farm.

On 12-Pole Creek, Harvey district, Mingo County, 400 feet north of Red Jacket Coal & Coke Co.'s No. 3 on the Red Jacket Consolidated Coal & Coke Co. tract, F. H. Yates has completed in the Maxon sand, at a total depth of 1,039 feet, a test on the Workman-Cowden farm, showing for a 5-bbl. pumper.

On Alford Branch, Duval district, Lincoln County, the South Penn Oil Co. has a rig completed for another test on the Lafayette Alford farm. On Walnut Creek, Elk district, Kanawha County, the Virginian Gasoline & Oil Co. has a rig completed on the J. F. Brown 500 acres.

SOUTHEAST OHIO

In the NE of Section 17, Island Creek Township, Jefferson County, William B. Tipton and others completed in the Berea grit a test on the James T. Purley farm. It is a duster. In the NW of Section 25, same township, the Two Ridge Oil Co. had the same luck at No. 3 on the George L. Huscroft farm. In the SE of Section 22, same township, Henry S. Kellemier got a very light pumper at No. 5 on the George W. Morroa farm.

In the SE of Section 15, Hopewell Township, Licking County, the Ohio Fuel Supply Co.'s test on the Alfred Fulf farm is a light gasser in the Clinton sand with no show of oil. In Section 9, Jefferson Township, Noble County, D. R. Greenless & Co. have a very light pumper in the Berea grit at No. 7 on the Coal Lands.

In the NE of Section 22, Elk Township, Noble County, Ohio, Henry Scheibe and others have completed a second test on the G. B. Bonar farm. It is a 3-bbl. pumper in the Germantown sand. In Section 4, Paint Township, Holmes County, the Ohio Fuel Gas Co.'s test on the Joseph P. Miller farm is a duster in the Clinton sand.

Meigs County

In Sutton Township, Meigs County, the Southern Ohio Gas Co. has started a test on the Hannah M. Capehart farm. In the same township the Preston Oil Co. has started to drill on Ohio state lands.

(Continued on Page 98)

CENTRAL OHIO FIELD MOST ACTIVE IN CENTRAL WEST DEVELOPMENT

By Whit
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Mar. 25.—With completions reported from all divisions of the Central West the only area to show any activity was the Central Ohio Field where the large gas companies are doing a lot of development.

In the old Lima Field of northwestern Ohio, R. M. Bell and others drilled a test 200 feet from the north line and 750 feet from the west line of the E. Hurrelbrink farm, on the oil map as the E. Linke farm, in the northeast quarter of Section 12, Troy Township, Wood County, the well producing an initial of 25 bbls., a very good well for that area. Sand was topped at 1,243 feet and drilled 50 feet into the sand. In Liberty Township, same county, W. E. Donnelly's test, 150 feet from the south line and 685 feet from the west line of the Charles South farm, on the map as the W. H. Levers farm, in the southwest quarter of Section 4, developed into a duster. Sand was topped at 1,222 feet and drilled to 1,344 feet, or 122 feet into the Trenton.

In Biglick Township, in the eastern portion of Hancock County, R. W. Kirk and others' test in the southeast corner of the Harriett Hays farm, in the northeast quarter of Section 34, developed a small gas well, the Trenton being found at 1,357 feet and drilled 143 feet in the sand to 1,500 feet. Watts and Harmon are drilling on the O. S. Bell 362 acres, in Section 18, Delaware Township, same county, in what is known as the Wharton gas area.

Wharton Oil & Gas Co. is starting a test on the Carrie Pickett farm, Section 17, Richland Township, Wyandot County, in the Wharton gas field.

INDIANA FIELD

Only one completion is reported from Indiana, which developed into a dry hole, although it was reported to have a nice gas showing which is said to have been exhausted quickly. It was drilled by Bowman and others on the A. McRillip farm, Section 24, Patoka Township, Pike County, 250 feet from the north line and 650 feet from the west line of the lease in the southeast quarter of the section. This test is 7 miles south of Petersburg.

ILLINOIS FIELD

The only completion reported from Illinois was W. C. McBride, Inc.'s No. 5 well, 1,120 feet from the south line and 200 feet from the east line of the A. W. Mann farm, in the southeast quarter of Section 13, Martin Township, Crawford County, which was dry at a depth of 1,895 feet, being one of the deep tests made in the county.

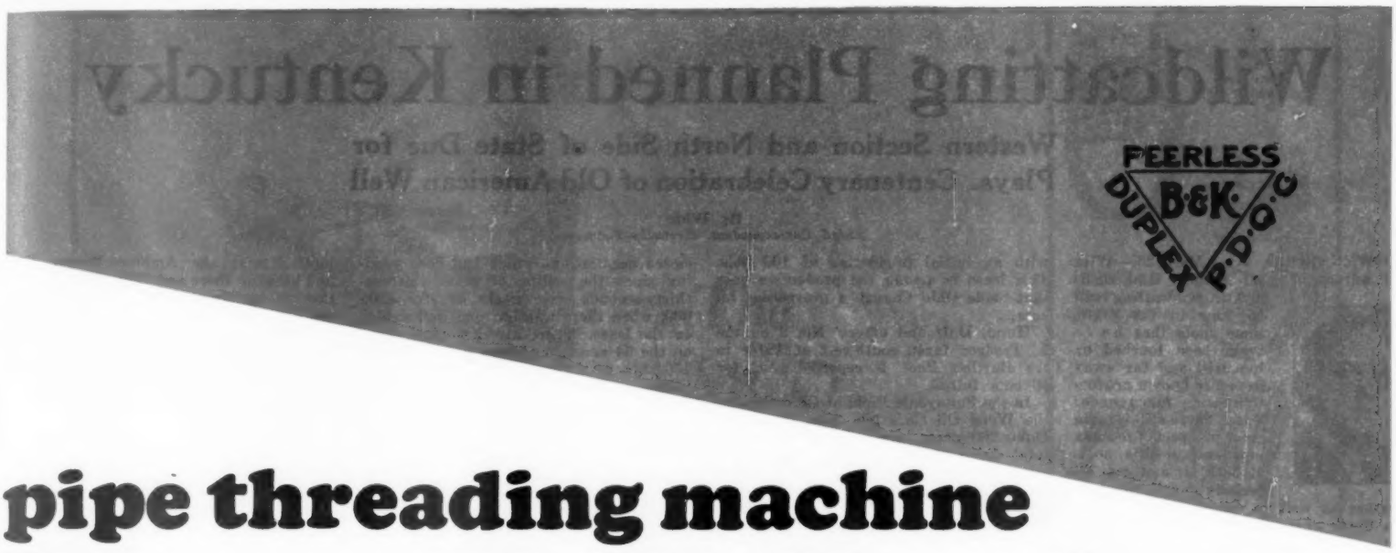
The Ohio Oil Co. has brought in another good well in Sugar Loaf Township, St. Clair County, east of East St. Louis. The production has not been announced yet, but this makes three producing wells for this company, two above the average in recent development in the western part of the State.

CENTRAL OHIO

Mud and high water have brought about less activity in the Central Ohio fields where there were about a dozen completions where there are generally more than 20. Total completions reported for the week were 12, of which 6 were producers with an initial production of 272 bbls., 4 dry holes and but 2 gas wells. The bulk of the work is being done by the gas companies, although shallow and deep sand oil are also being sought. There are 7 new locations and 14 new wells started spudding, a total of 21.

Ashland County failed to report a completion and the only change is the starting of a well by the Ohio Fuel Gas Co.

(Continued on Page 178)



pipe threading machine
Bignall & Keeler

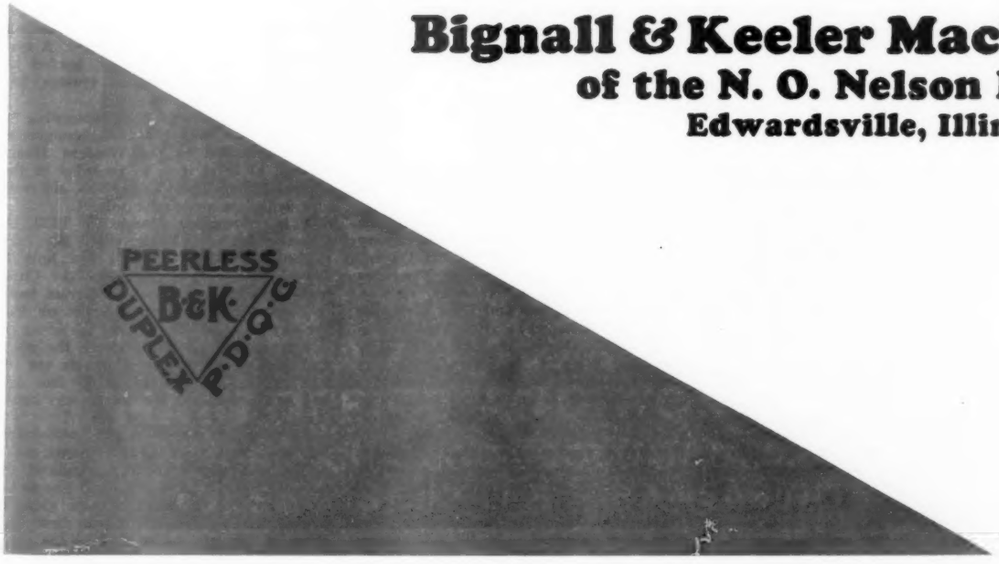
The new No. 12 Duplex machine represents the most advanced design in pipe threading equipment. It has a 15¼-inch bore and will handle all casing from 4 inches up to 13⅜-inch A.P.I. The carriage travel is 32 inches, and pipe can be threaded within 2 inches and cut off within 13 inches of the chuck face. This machine has a one-piece bed. Lower half of gear box is cast integrally with it assuring perfect alignment and greatest rigidity.

A special double throw positive clutch on the bed shaft enables operator to obtain eight speed changes with the two sets of shifting gears. All gears are made of steel with wide faces, and machined teeth, providing quiet operation and a lifetime of troubleless service.

Standard equipment consists of 9 sets of R.H. pipe dies. Equipment to suit your needs can be substituted. The sliding die head can be made for dies either 2-11/16 in., 3-7/16 in. or 4-7/16 in. wide. Other features such as beveled high speed cut-off tool, combination reaming and beveling tool and large gear type cutting oil circulation pump insure maximum speed and efficiency of thread cutting.

Bignall and Keeler machines are made in seventeen types and sizes —a complete range to choose from.

Bignall & Keeler Machine Works
of the N. O. Nelson Mfg. Co.
Edwardsville, Illinois



O&GJ 3-28-Gray

Wildcatting Planned in Kentucky

Western Section and North Side of State Due for Plays. Centenary Celebration of Old American Well

By Whit
Staff Correspondent, Kentucky-Tennessee

OWENSBORO, Ky., Mar. 25.—With the advent of good weather and roads much wildcatting will be done in the State, some spots that have never been touched by the drill and far away from any known production being taken under lease. There still remain great prospects for many new and prolific pools of both oil and gas, especially in the western portion as well as on the north side of the State where little test work has been done.

Week's Work

A summary of the week's work in the Kentucky fields show 14 completions, 11 producers with an initial production of 362 bbls., 2 dry holes and 1 gas well.

County—	Oil Comp.	Wells	Prod.	Dry	Gas
Ohio	4	4	220	0	0
Daviess	4	3	120	1	0
Wayne	4	3	12	1	0
Barren	1	1	10	0	0
Floyd	1	0	0	0	1
Total	14	11	362	2	1

Eastern Kentucky Wells

In the Beaver Creek Field, District 21 of Floyd County, the New Domain Oil & Gas Co. drilled in a fairly good gas well on the Howard Purchase farm. According to reports a large number of wells will be drilled for gas in both Floyd and Knott Counties during the year. The United Carbon Co. is drilling on the S. B. Osborn farm, also on the Melvin V. Allen farm, same district. The Yolando Oil Co. is also drilling on the Caroline Colleries property, same area.

The Petroleum Exploration Co. is drilling on the George Brewer farm, in Clay County, and starting a test on the J. F. Johnson farm, same county.

The Boston-Southwestern Oil & Gas Co. is about due to bring in No. 16 on the Frank Conley 66 acres, District 30, of Johnson and Magoffin Counties. Baldwin and Morgan are also due to bring in No. 4 on the Nancy Vanderpool farm, District 27, same counties, and in the same district Wagner and Matthews are also near pay sand in No. 3 on the Fairchilds heirs lease. Ralph Stafford and others are drilling close to the sand on the J. A. Williams farm, District 25, same area.

In District 8, of the Irvine Field of Estill County, the Superior Oil Corp.'s No. 15 Sam Brinegar farm, is a 2-bbl. pumper, as is the same company's No. 17 on the Green Campbell farm. This company is due in with No. 30 on the Thomas Henderson farm, also due to complete a well on the Owen Pickett heirs farm, same district.

In the Monticello Field, District 13, Wayne County, Shearer, Hurst and others' No. 5 on the Coyle heirs farm, produced 8 bbls., while William O. Southern, Jr.'s No. 1 H. Frost, was a dry hole. George A. Hook is due to complete a test on the Oscar Rector farm, same district. In District 5, same county, Porter, Abbott and others are also due to complete No. 7 on the Coffey-Oatts farm.

The Hamlin-Tanner Oil Co. is drilling near sand in No. 4 on the Milt Tackett farm, District 29, Johnson-Magoffin Counties.

No report has been made in regard to the drilling well by Dizney & McKee on the Dizney farm, at Bailey Switch, in Knox County.

Ohio County

The best completion reported from the Ohio County fields is Daley and Lowman's No. 17 on the Ollie Ezell farm, between the Ambrose-Weller Pool, and the Bells Run Pool, which is credited with an initial production of 100 bbls. This lease is among the productive ones that made Ohio County a prosperous oil area.

Hupp, Duff and others' No. 2 on the L. Trodgen farm, southwest of Taffy in the Bartlett Pool, is reported good for 50 bbls. initial.

In the Sunnydale Field of Ohio County, the Wood Oil Co.'s No. 8 on the R. A. Duke 200 acres, produced 20 bbls. at a total depth of 460 feet. In this well a string of 419 feet of casing was set, sand at from 442 to 453 feet, shot with 70 quarts. Same company set a string of 416 feet of casing, got the sand at from 436 to 454 feet in No. 6 on the J. C. Ralph 21 acres, produced 40 bbls. after given an 80-quart shot. The total depth was 465 feet.

Daviess County

The well making the best showing of any in Daviess County was Huff and Calderwood's No. 4 on the Bell Salmon farm, just east of the Burton farm, in the Burton Pool, being credited with 50 bbls. initial, although the Jetsan Oil Co.'s No. 3 on the S. Hinton farm, in the Jones Pool, is reported good for 60 bbls. initial.

L. A. Clough and others drilled a test between the Jones and Burton Pools on the Ivy farm, 12 miles southeast of Owensboro, that is credited with 10 bbls.

The Ohio Oil Co.'s test on the Frank Marteniz farm, 5 miles west of the Brown Pool, in southern Daviess County, is reported dry.

Barren County Well

In the Glasgow Field of Barren County and in the Lecta Pool, George L. Porter and others' No. 4 on the Hickerson farm is said to show for close around 10 bbls. initial.

More lease trading resulted in the St. Joseph area in the extreme western part of Daviess County because of the showing of oil found on the Edward Hamilton farm about 3 miles west of St. Joseph, and not far removed from the Henderson County line and the villages of Jolly and Curdsville. Lands that had not been considered of much value have risen in price because of the oil showing. No further steps had been taken toward development of the well, although visitors stated the oil was coming out through crevices in the equipment, which showed for good stuff.

A rise in Rough River again put operations in some parts of Daviess and Ohio Counties out of business.

Cumberland Petroleum Co. is due to bring in No. 1 on the Hayden heirs lease in the Burton area and an offset to the west of the Widow Salmon farm, in Daviess County.

Owensboro District

The test of the Sidney Petroleum Co. on the C. A. Rogers farm, 3 miles west of Owensboro, and close to the federal highway, is being closely watched as it has only a few hundred feet to drill before the sand is expected, the hole at last reports being around 1,100 feet. This is a pure wildcat and the owners will be well satisfied if they find either oil or gas in commercial quantities, for should a good volume of gas be found it will mean much for Owensboro so close to the city.

Wood Oil Co., Inc., has set a string of 1,480 feet of casing in a test on the Ford farm, near Browns Valley, due to hit pay sand at most any time. This venture is in the southern part of Daviess County.

A. F. Berg, owner of thirteen-thirty-seconds of the Ellis Bartlett 54-acre lease, southwest of Taffey, in Ohio County, closed a deal with Elmer Hupp, operator of Lexington, Ky., for the purchases of his interest at $30,000 and some smaller concessions, valued at about $5,000. This closed negotiations which had been pending since the selling of other thirteen-thirty-seconds some weeks ago for $20,000, when there was but one well drilled on the lease. There are now three wells on the 54 acres, producing approximately 450 bbls. of oil daily with some 10 more locations should the drilling prove profitable. George Trout, another partner in the lease, holds a one-sixteenth interest, and Leonard Daniel, one of the drillers, another one-sixteenth.

The Wood Oil Co., Inc., found the Jett sand thicker than usual in No. 15 on the Bartlett farm, 3 miles east of Whitesville, in Ohio County, but concluded to make a deep test of the well and will drill it to the Bethel sand, and if production is not found there it will be plugged back to the Barlow or Jett sands, for the showing in the Jett sand, which is above the Barlow sand, is for a very good producer.

Harry Russell bought in the Greer-Brown heirs leases, which were sold at the courthouse in Hartford, Ohio County. Mr. Russell paid $20,000 for the leases, which were owned by Oliver Jenkins and W. L. Schmidtt. There are four producing wells on the Brown lease with 25 bbls. production, the Greer lease being undeveloped.

C. B. Robinson, J. C. Ramey and J. S. Albertson moved a rig to a location on the Myrtle Lyons lease in Hancock County, directly across the river from the Packard Oil Co.'s well in Spencer County, Indiana. These parties have a block of 1,500 acres under lease, and they contemplate the drilling of several tests as soon as weather conditions permit.

Court Decisions

The decision by the Court of Appeals on the Kelley-Hardwick suit quieting the title to the Mahloskey, Brown, Leet and other leases in the Utica Pool removed another slight question mark from the lease taking situation in the western Kentucky division. Leases were taken on several thousand acres of land in southern Daviess County by H. Lee Kelley, now sheriff of Warren County, 10 years ago when the Bowling Green Field was at its peak, but failed to develop the property. No rentals were ever paid, but when the Leeper Oil Co., Miller & Damron and other operators began to bring in fine wells in that section, Kelley tendered rentals for the entire period due in hopes of reviving the leases. The owners declined the rentals and he brought suit in Circuit Court to reinstate them. Judge Wilson sustained a demurrer to Kelley's petitions in three cases and the Mahloskey case was taken to the Court of Appeals, with the result of the old leases were declared lapsed and of no value.

A suit from Ohio County of Ward and others, against Daugherty and others, concerning leases in the Whitesville Pool, was also affirmed by the Court of Appeals.

Judge Wilson handed down a decision in three oil lease suits in the Ohio County Circuit Court, in which several Owensboro operators were concerned. The cases were those of M. L. Wheeler, trustee, against W. A. Himes and Fred Weir, the latter of Owensboro; Aus Tucker and L. C. Young, Owensboro, and A. B. Jolly and Fred Weir, C. B. Short and others of Owensboro. The Owensboro operators had top-leased the lands of Himes, Tucker and Jolly, the petitions decleared, after they had been regularly leased to Wheeler by land owners. Wheeler brought the suit to clear the titles of the land so that drilling may be done on them. The court held the top-leasers took no title.

Ollie Ezell and Mrs. Annie Ezell, his wife, were adjudged to be the sole owners in fee simple of 199 acres of oil lands, located near the Ambrose-Weller Pool and between there and Bells Run, in Ohio County, by Circuit Judge George S. Wilson.

Seven suits were filed in the Ohio County Circuit Court two years ago by heirs of J. K. Mitchell, from whom the tract of land was bought many years ago, attacking the title, after development as an oil lease.

Dr. L. C. Young, Daley and Loman, L. P. Lee and the Ezells were made defendants. Approximately $12,000 worth of oil each month is being pumped from the 16 wells now in operation on the tract, and two others are being drilled by the operators.

J. K. Mitchell moved from Tennessee to Ohio County in 1868, it was disclosed in the petition, but died a few years afterwards, leaving his widow Jane Mitchell and several children. Some of the latter married and moved away while others remained at home. In 1900 Mrs. Mitchell sold the big tract of land to W. P. Simmons, who subsequently sold it to Mr. and Mrs. Ezell, who have since owned the land.

In 1926 the Ezells executed a lease on the entire tract to Young and Lee and later subleased 50 acres to Daley and Loman. The plaintiffs alleged their father J. K. Mitchell, and not their mother, owned the land, and the title, except as a dower, was in them, and thereby had not been legally conveyed to Mr. and Mrs. Ezell. The plaintiffs claimed at the death of their mother the title passed to them by inheritance.

Old American Well

The one-hundredth anniversary of the bringing in of the Old American oil well was observed at Burkesville, Ky., on March 11 by the oil fraternity of Cumberland County, Kentucky. A dinner was served and several impromptu speeches were made, according to the Bowling Green Journal. The Old American oil well, known in history as the first oil well drilled in America, was brought in by Emmerson and Stockton, March 11, 1829, on the banks of Little Rennox Creek, then known as Little Renicks Creek, 3 miles north of Burkesville, and within a few feet of the new road built connecting Burkesville and Columbia.

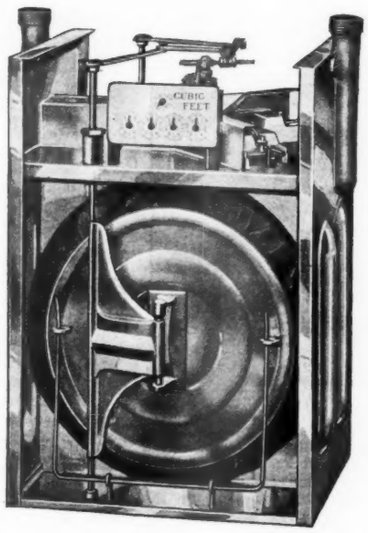
In commemoration of the one-hundredth anniversary, a drilling machine was moved to the W. R. Carter farm, on which the Old American well was drilled, and drilling will begin for oil within 200 feet of the old well in a few days. A syndicate of Kansas City men, headed by Finley N. Scott, acting as trustee, has just made the location.

The Old American well, according to some reports, was the first commercial oil well drilled in the Western Hemisphere,, at least it is so recorded in the Encyclopedia Britannica. The old well was drilled in search for salt.

A letter written March 15, 1829, by Thomas Ellison, Burkesville, Ky., described in detail the well and how it flowed. The oil flowed down the Cumberland River and covered it from bank to bank for miles, and was set on fire the day he wrote the letter, the sheet of fire stretching for miles down the river and causing consternation among the inhabitants, as many believed the last day had come and that the world was burning up.

Oil from this well was later bottled and sold as a remedy for many ailments, some of the bottles being sent to England. A few of the original bottles still are to be found around Burkesville and vicinity among the descendants of the first settlers. A few are sealed, full of the orig-

(Continued on Page 116)



The EMCO Tin Meter

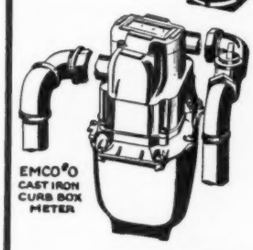
THE design and construction of the EMCO Tin Meter meets the rigid standards already set up for types of meters and regulators bearing the EMCO name. After extensive research rigid specifications were established and are constantly maintained.

Progressive, up-to-the-minute manufacturing methods share greatly in the success of this meter. The interchangeability of EMCO A and B Type meter parts, the easily adjustable tangent, the long wearing rock shaft and the fact that each meter is proved three times before passed as "OK" spell accuracy and reliability.

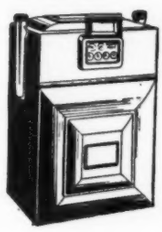
EMCO—*wherever you go.*

EMCO #0 CAST IRON DRY GAS METER

IRONCLAD CAST IRON DRY GAS METER

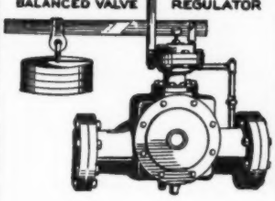


EMCO #0 CAST IRON CURB BOX METER

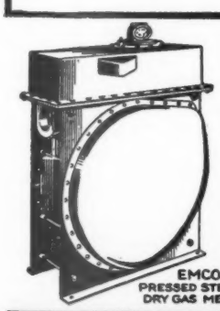


EMCO TIN METER

EMCO HIGH PRESSURE BALANCED VALVE REGULATOR



EMCO WATER HEATER AND GAS APPLIANCE REGULATOR



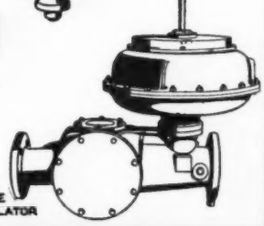
EMCO #5 PRESSED STEEL TYPE DRY GAS METER

WESTINGHOUSE FLUID POSITIVE GAS METER

EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE

EMCO ORIFICE GAS METER

EMCO DOMESTIC SERVICE REGULATOR



EMCO LOW PRESSURE BALANCED VALVE REGULATOR

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS
TULSA SEATTLE KANSAS CITY SALT LAKE CITY

EQUIPMENT AND SUPPLIES

MAKERS OF EQUIPMENT IN CO-OPERATIVE MOVE

Thirty-two independent makers and distributors of tractors, farm implements and industrial equipment in North America have organized the United Tractor & Equipment Corp. Combined assets of the companies in the co-operative manufacturing and marketing movement are above $125,000,000. Through several hundred selected dealers in the United States and in Canada the 15 manufacturers and 17 distributors will market a line of farm and industrial tractor equipment designed to be operated with their tractor, the United.

The tractor is in production under contract by the Allis-Chalmers Manufacturing Co. of Milwaukee, Wis., a member of the corporation. The products of the members to be operated with the tractor will carry the United trademark and color scheme. Tractor production for dealers and users follows a year's shop and field tests.

"We united the greatest forces of commerce, manufacture and distribution, to build and market a full line of equipment and our tractor at the lowest cost consistent with high quality," Milton W. Anderson, president and general manager, announced from his office in Chicago.

"With only noncompetitive manufacturer and distributor members, we have eliminated competition in manufacturing and selling among our membership that was expensive alike to the manufacturer, distributor, dealer and customer. At least 15 per cent of any retail price is selling cost. Often the percentage is much greater. We have cut it to the minimum by knowing requirements of dealers and distributors, anticipating and pooling buying of materials, charting manufacturing schedules over a year's time and ending costly, unnecessary duplication of sales efforts."

BURNER SHOWN IN MUSEUM

A Mettler entrained combustion gas burner is being placed on exhibition in the Science Museum in London, England. According to the Lee B. Mettler Co., Los Angeles, Calif., manufacturer, 250,000 of these burners are produced each year. The company assembles the parts, which are made in Los Angeles factories. The burner is designed to give greater efficiency in the burning of gas. Recently the museum in London wrote to the Mettler company asking that a burner be sent for exhibition.

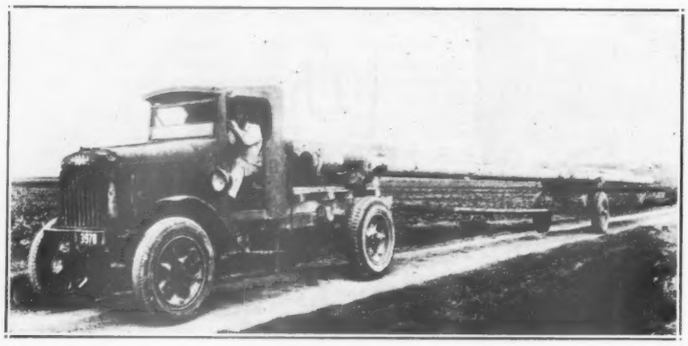
BIG FIST SHOVEL ANNOUNCED

The Wood Shovel & Tool Co., Piqua, Ohio, manufacturer of "Moly" shovels, is introducing the "Big Fist" brand of shovels, spades and scoops. "After three years of experimenting, preceded by 10 years of tests on the Moly shovel," says Wilson Wood, president of the company, "we have developed a heat-treating process which enables us to make a shovel steel of exceptional strength and toughness. C. L. Butts, sales manager, says the Big Fist line will be backed by an aggressive merchandising campaign.

GENERAL OFFICES IN TULSA

The United Iron Works, Inc., on April 1 will establish its general offices in the Hunt Building, Tulsa. These offices now are in Kansas City, Mo., and the change in location is made, according to the company, better to enable it to serve the petroleum industry, from which it derives 75 per cent of its total volume of business.

INTERNATIONALS CARRY 60-FOOT LENGTHS OF PIPE



The illustration shows an International Harvester 3-ton motor truck with semi-trailer loaded with unusually long 8-inch and 10-inch oil line pipe sections.

The pipe was for the construction of a 32-mile line near Waxahachie, Tex., by Dunn Brothers, contractors, for the Texas Petroleum Co. The sections are 60 feet in length and are 20 feet longer than those ordinarily used. They are said to be the longest ever laid in the United States. By the use of such long sections, the number of joints required was reduced and thus construction costs were very considerably lowered.

One motor truck was equipped with derrick and hoist, operated by the motor truck engine, and these were employed to remove the pipe sections from the railroad cars to the motor trucks.

CONTINENTAL MEN VISIT EMSCO PLANTS ON COAST

Seven representatives of the Continental Supply Co., which recently added the products of the Emsco Derrick & Equipment Co. to its line, have returned from California, where they went through Emsco plants and visited oil fields to inspect Emsco equipment in operation. The party included C. E. Ross, district manager, Fort Worth, Tex.; T. M. Combs, assistant district manager, Midland, Tex.; William Hines, Big Spring, Tex.; O. G. Houser, store manager, Seminole, Okla.; Neal Harris, representative in Maud, Okla.; P. J. Clarkson, assistant district manager, Ardmore, Okla., and A. J. Olson, manager of the machinery department, Tulsa.

While the visitors were in Los Angeles they were entertained by Charles Wagner, vice president and sales manager of the Emsco company, who took them to Catalina Island in his 50-foot yacht. On the trip to the island a windstorm arose, tossing the boat about and causing uneasiness on the part of some of the passengers. On the return the nervous ones indicated they would feel safer if Neal Harris, who weighs about 250 pounds, rode on one of the big excursion boats. Harris obliged them.

FLOODLIGHTING PROJECTORS

A new line of floodlighting projectors announced by the General Electric Co. is of interest to managers of factories, office building and stores. The new projectors are designed for floodlighting power stations, office buildings, filling stations, factories, public buildings, railroad yards, docks, bridges, parking areas, construction camps, etc. The projectors have nonferrous, and hence nonrusting, casings; and the glass reflectors and lamps are totally enclosed so that dust and dirt cannot enter or impair efficiency. Good heat radiation and minimum dimensions of design are afforded and the units are light in weight. Ease and accuracy in focusing are attained through the use of universal focusing mechanisms. A small three-point base design and swivel give simple and economical mounting, with ease of installation and orientation of the floodlight beam.

MINE SAFETY APPLIANCE AWARDED SAFETY TROPHY

The Mine Safety Appliances Co., Pittsburgh, was awarded the Cecil G. Rice safety trophy at the annual banquet of the safety school conducted by the Western Pennsylvania Safety Council held in Pittsburgh last week. The banquet was attended by more than 1,800 men and women from the industrial plants of the Pittsburgh district who had completed the safety lecture course. Phil G. Fenlon of the Duquesne works of the Carnegie Steel Co. acted as toastmaster, and Frank L. Duggan, president of the western Pennsylvania division, presided. The principal speaker was Frank Phillips, vice president of the Philadelphia Co.

The trophy is awarded annually to the company in western Pennsylvania having the best safety record for the previous year. The announcement that the Mine Safety Appliances Co. had won the award was received with enthusiasm as this company is dedicated to safety, being engaged entirely in the manufacture of safety appliances.

TRADE LITERATURE RECEIVED

"The tiger that crawls on its stomach" is the way natives of Manchuria described their first Caterpillar tractor, according to the current issue of the Caterpillar Magazine, published by the Caterpillar Tractor Co., San Leandro, Calif.

Bristol's automatic electric control valves are the subject of a 20-page catalog prepared by the Bristol Co., Waterbury, Conn., which for 40 years has been designing and making instruments for recording temperatures and for many years has been making temperature control equipment.

Articles of interest appear in the current number of the Hercules Record, published by A. Leschen & Sons Rope Co., St. Louis, Mo., manufacturer of wire ropes for oil field and other uses.

The latest number of "Sivyer Reports," published by the Sivyer Steel Casting Co., Milwaukee, Wis., is "dedicated to a man in overalls," who with his kit of tools must make repairs quickly when failure occurs in some important machine.

HIGH-TEST WELDING ROD PRODUCES STRONG JOINT

"The ever-increasing scope of oxy-acetylene welding, especially as applied to production of such highly stressed structures as pressure piping, for oil, gas, and water transmission; pressure vessels; and the complicated joints used in the manufacture of airplane fuselages, has created a definite need for a means of producing welds of uniform high strength," says the February number of Oxy-Acetylene Tips, published by the Linde Air Products Co., New York.

"The problem was studied by the Union Carbide & Carbon Research Laboratories, Inc., the object being to devise a welding rod which would produce a weld metal equal or superior in physical properties to the commercial grades of steel used for welding. The result of these investigations and experiments led to the production of a special welding material, Oxweld No. 1 high test patented steel rod. Before being offered for use commercially, this rod was submitted to many tests under all sorts of field conditions; the favorable results obtained confirmed the success of the laboratory investigations.

"The use of oxwelding has been greatly stimulated by the introduction of this rod, and the field of welding applications has been broadened to include the fabrication of many articles requiring high strength welded joints. Since its introduction exceptionally satisfactory results have been consistently obtained through its use in practically every industry for all types of joints in steel."

BUSINESS NOTES

A. V. Simonson, manager of the New York office of the Gaso Pump & Burner Co., spent a few days at the plant in Tulsa conferring with the officials of the company before departing for Venezuela where he plans to make a tour of the principal producing areas.

Roy E. Kohn has been made secretary and general manager of the Westcott Valve Co., East St. Louis, Ill. For nine years Mr. Kohn was with the Continental Supply Co., two at the Dallas, Tex., branch, and seven as manager of the Pittsburgh division.

A plant expansion program by the Boeing Airplane Co., Seattle, Wash., includes an office building, a time office building and a master sewer system for the general plant. The Austin Co., Cleveland, Ohio, is the architect and builder.

R. L. Sittinger, Boston, Mass., has been appointed New England representative for the Copes system of boiler feed control.

LEWIS & CO. MADE AGENTS

The George D. Roper Corp. of Rockford, Ill., has appointed Lewis & Co. of Philadelphia, Pa., as a representative in the territory comprising Delaware, Maryland, New Jersey, Virginia, the District of Columbia and the eastern half of Pennsylvania.

Lewis & Co. will distribute the Roper Corp.'s entire line of traction rotary gear pumps.

HOLDER FOR ARC WELDING

The Lincoln Electric Co., Cleveland, Ohio, announces an improved type of electrode holder for metallic arc welding designed for greater operator convenience. The holder consists essentially of a powerful clamp to hold the welding electrode firmly while welding and with an easy release feature which permits changing electrodes quickly.

IDEAL TOOL JOINTS

MANUFACTURED IN ALL SIZES FOR WHICH A. P. I. SPECIFICATIONS HAVE BEEN ADOPTED

THE NATIONAL SUPPLY COMPANIES

Natural Gas Developments

MORAN CORP. LINES IN LOUISIANA SOLD

SHREVEPORT, La., Mar. 23.—Transfer of the pipe line and distributing systems, franchises, etc., of the Moran Corp. of the South and this division to the Empire Public Service Co. is announced. The Moran Corp. has been operating in north Louisiana three or four years supplying gas to small communities in northeast Louisiana and lately adding two towns in Union County, Arkansas, and one in Union Parish, Louisiana. A year ago it bought all The Texas Company's retail gas business and has been supplying all the communities previously served by the larger company. The Empire Public Service Co. is a Day & Zimmerman property controlled by the United Gas Improvements Corp. and operates on a large scale in Louisiana, Texas and Colorado. Through acquisition of the Moran properties it will expand its Louisiana activities to supply gas to 16 towns in north Louisiana and two in Arkansas, serving approximately 2,000 meters.

With the sale to the Empire company, the Moran Corp. withdraws from the North Louisiana-Arkansas Field to concentrate on Southwest Texas. It already has a 6-inch line from the White Point gas field to Ingleside where it supplies fuel to the Humble Oil & Refining Co.'s refinery, serving Portland, Gregory and Aransas Pass also, and will shortly complete another line to Aransas Pass to supply a large cement mill.

Floyd W. Woodcock is at the head of the Empire company, and W. T. Moran, of Shreveport, is president; D. C. Jones, of Cincinnati, vice president, and J. M. Newman, secretary-treasurer of the Moran Corp., which retains its north Louisiana gas producing and oil properties.

SECOND COMPRESSOR STATION FOR WASKOM

SHREVEPORT, La., Mar. 25.—Dixie Gulf Gas Co. is spending between $100,000 and $125,000 in construction of a second compressor station in the East Texas gas field, 12 miles south of the Waskom main line station, which is expected to be in operation within 30 days. The installation is by the Hope Engineering Co. Equipment is the same as that of the main line station at Waskom except there are fewer units, and consists of six 160 horsepower Hope vertical compressors with two 40 horsepower 25 kilowatt generator sets for the auxiliary power equipment.

The plant, construction of which is under supervision of Paul Wright, superintendent of the Dixie Gulf Co. Waskom plant, and H. S. Johnson, of the Hope Engineering Co., was made necessary by declining pressure in the Bethany district of Panola County and will deliver 20,000,000 feet of gas daily to the Waskom plant for transportation to Houston and Port Arthur terminals and the intermediate communities on the main and branch lines served with wholesale gas by the Dixie Gulf company.

SOUTHWEST UTILITIES CORP.

Organization under the laws of Delaware of the Southwest Utilities Corp., a subsidiary of the Empire Public Service Corp., which will include the Big Spring Public Service Co., Consumers Natural Gas & Power Co., Texas Electric Co., Texas Sewer Co., Southwest Ice Co. and the Minden Gas Co., is announced. This new corporation it is said furnishes, through its subsidiaries, electric light and power, natural gas, ice and sewer service, to 10 municipalities in Texas and Louisiana having a total population of 70,000.

H. L. DICKERSON JOINS UNITED GAS ENGINEERING

HOUSTON, Tex., Mar. 23.—Rapid expansion of business of the United Gas Engineering Co. of Houston has necessitated the creation of a new position, that of assistant general manager, and the place has been filled by H. L. Dickerson.

H. L. Dickerson

A. C. Howard is vice president and general manager of the company, which is the engineering subsidiary of the United Gas Co.

Mr. Dickerson has been in the public utility and construction business for 25 years. He comes to the United Gas Engineering Co. from the Henry L. Doherty Co., and previously has been associated with J. G. White & Co., H. M. Byllesby & Co., Associated Gas & Electric Co. and Cities Service Co.

HELIUM GAS FOR CANADA

CHATHAM, Ontario, Mar. 23.—Canadian operators are interested in the announcement by Sir Samuel Hoare, air secretary, in the British House of Commons, that commercial development of helium gas resources in Canada is possible as the result of the building of two giant dirigibles for transoceanic transport by the British Air Ministry. Sir Samuel Hoare stated that the Canadian government would be approached in regard to the possibility of producing helium in Canada, on the same scale as it is now produced in the United States. There are two known sources in Canada, the declining Bow Island gas field in Alberta, and a small field in Ontario near Inglewood, in Peel County. The latter is now under control of the Ontario government.

TO UTILIZE WASTE GAS

CHATHAM, Ontario, Mar. 23.—Announcement has been made by J. E. Brownlee, premier of Alberta, that the entire resources of the chemical and research departments of the University of Alberta have been placed at the disposal of British capitalists who are investigating the possibility of utilizing the waste gas of the Turner Valley Field for the production of chemicals. Though carbon black manufacture is a possible detail, the project goes considerably further. It is planned to break up the gas into its constituent parts, and utilize it in certain chemical manufacturing processes.

COLUMBIAN CARBON REPORT ON OPERATIONS

The annual report of the Columbian Carbon Co. shows as subsidiary and controlled corporations Columbian Carbon Co. of West Virginia, Southern Carbon Co., La Del Oil Properties, Inc., The L. Martin Co., Western Carbon Co., Monroe Gas Co., Pineville Gas Co., Southern Gas Line, Inc., Coltexo Corp., The Amalgamated Co., Piney Oil & Gas Co., Teton Gas Products Co., Sebs Chemical Co., and Columbian Gasoline Corp. Plants are located at Campbell's Creek, W. Va.; Fairbanks, Spyker, Perryville, Fowler, Swartz and Hammock, La.; Philadelphia, Johnsonburg and Easton, Pa.; Parks, Pioneer, Wescar, Lela, Lefors, Pampa, Kingsmill, and Shamrock, Tex.; and Greenwich, England.

The report states that in 1928 sales increased 21 per cent and profits 45 per cent. Consolidated earnings after all operating charges and taxes but before depreciation and depletion amounted to $4,449,318. After reserving $1,457,956 for depreciation and depletion and allocating $164,066 to minority interest in subsidiary corporations, the net available for dividends on the stock of the company was $2,827,295, which was equivalent to $6.95 per share on the average number of shares outstanding during the year. Current assets on December 31, 1928, amounted to $7,873,262, of which $4,047,240 consisted of cash in bank and call loans, against total liabilities of $1,152,674. Cash and call loans included the unexpended balance of the proceeds of the new stock issued on November 22.

Natural gas sales exceeded 25,000,000,000 feet, or an average of 68,000,000 feet per day. Over 90 per cent of these sales were made in the field or delivered from pipe lines at wholesale gate rates.

The volume of carbon black produced and sold surpassed any previous year. Inventories were materially reduced. Prices averaged about one-fourth of a cent per pound higher than in 1927. Business in lamp and bone blacks was dull.

Gasoline output increased about 14 per cent, and the average price showed an improvement of eight-tenths of a cent per gallon.

Production of carbon black was 79,194,473 pounds; lamp black and other pigments, 3,204,998 pounds; gasoline, 11,951,339 gallons; and natural gas, 47,112,301,000 feet.

Natural gas sales were 25,304,073,000 feet and gross revenue was $2,310,109.

In October the Coltexo Corp. completed a casinghead gasoline plant at Lefors, Gray County, Texas, with a capacity of 20,000 gallons per day. A second plant of 10,000 gallons daily capacity has since been built in the same area. The residue gas will be used for carbon black manufacture. The Coltexo Corp. is owned by Columbian Carbon Co. and The Texas Corporation in the respective proportions of 51 and 49 per cent. The bulk of the gas for the operation will be supplied by The Texas Corporation.

A development of major importance was the formation of a syndicate for the purpose of financing the construction of a natural gas pipe line from the Monroe and Richland Fields, in Louisiana, to St. Louis. The syndicate is composed of the Standard Oil Co. of New Jersey, Electric Power & Light Corp., Columbian Carbon Co., and three other companies having substantial holdings in the northern Louisiana fields. The proposed line is intended primarily for the supply of gas for industrial purposes, and will have a capacity in excess of 100,000,000 feet per day. It will be owned by the Mississippi River Fuel Corp. Columbian Carbon Co. will acquire 17 per cent of the common stock of this corporation and will furnish 21 per cent of the gas.

A contract has been made to furnish approximately the same percentage of the gas requirements of the proposed pipe line of the Southern Natural Gas Corp. from the Monroe and Richland Fields to Birmingham, Atlanta and other cities. The company also expects this year to begin supplying a part of the gas required by the pipe line serving Memphis.

GREAT GAS HOLDERS PROVED ECONOMICAL

CHICAGO, Mar. 23.—Samuel Insull, president of Peoples Gas Light & Coke Co., says gas holders, such as the company's new 20,000,000-cubic-foot holder, give the gas industry great advantage, since by their use fuel may be stored economically 24 hours a day.

"Ample capacity in gas holders lessens the investment necessary to provide for peak demand," he said. "On last Thanksgiving day, the Peoples Gas Co. had to deliver in one hour, from noon to 1 o'clock, 15,108,000 feet of gas. The average supply for this hour, exclusive of holder storage, was only 8,000,000 feet. The other 7,108,000 feet had to be drawn from the reserve supply in the gas holders.

"Without those gas holders, we would have had to have a production capacity and equipment sufficient to make gas for that extra demand, above the average, of 7,108,000 feet, and that equipment would have required an investment of about $34,000,000. The holder capacity at that time represented an investment of about $9,000,000, therefore the holder investment of $9,000,000 saved us the necessity of providing a production capacity investment of $34,000,000, or a net saving of $25,000,000 of investment, with corresponding saving in fixed charges on the investment."

He added that W. G. Rudd, vice president in charge of operation, told him the company probably would begin building the next 20,000,000-foot holder in 1929 or 1930, and that it would be either next door to the present holder of that size, or else at the Peoples Gas plant at Crawford Avenue.

UNITED CARBON SALES

SHREVEPORT, La., Mar. 23.—Sales of carbon black, gasoline and natural gas by the United Carbon Co. of Wilmington, Del., operating in the Monroe Field of northeast Louisiana, totaled $5,500,000 compared to $3,375,000 the year before. During the year the company dismantled some of its plants in the Monroe Field and moved them to West Texas with which, and new material, it built five plants, decreasing the Louisiana output of carbon and natural gasoline so that during the current year Texas production will double that of Louisiana where consumption of gas for carbon making is subject to certain restrictions. There are no restrictions of the sort in Texas. During the year sales of gas to pipe lines increased considerably. The company, formed by the merger four or five years ago of half a dozen or more carbon and gasoline concerns in the Monroe Field, now has 242 wells with a daily open flow capacity estimated at 900,000,000 feet subject to a pull not to exceed 24 per cent of any one well, 54 of which were drilled in 1928.

GAS FOR SASKATCHEWAN

CHATHAM, Ontario, Mar. 23.—Announcement has been made by Glen M. Ruby, manager of the Hudson's Bay-Marland Oil Co., that contracts have been let for drilling two tests in southern Alberta with a view to developing a possible gas supply for Regina, Saskatchewan. A franchise has been tentatively granted by Regina to a Chicago firm.

ROCKY MOUNTAIN AREA

(Continued from Page 56)

tions were thicker than expected. The Continental Oil Co.'s No. 1 Boundary Butte, Section 22-43-22, San Juan County, is drilling at 4,630 feet, below the horizon in which it had considerable gas with no further change in conditions.

The Utah Oil Refining Co. is reported to have acquired the interests of the Moab Consolidated Oil Co. in the two tests being drilled on the Cane Creek and Salt Valley Structures in Grand County by the Utah Southern Oil Co., and both are to be drilled deeper. The Utah Southern's No. 1-A J. L. Shafer, Section 36-26-20, Cane Creek Dome, a short distance north of the discovery well drilled several years ago by the Midwest interests, is drilling at 3,095 feet in sandy lime and has had no salt for the last 100 feet. The section shows so much less salt and more shale, sand and lime than the discovery that the prospects look very favorable and preparations are being made to go deeper. The discovery well had considerable oil below the present depth of No. 1-A, but no satisfactory test could be made. The Utah Southern's No. 1 King, Section 13-23-20, Salt Valley Dome, resumed this week at 3.001 feet in sandy lime after being shut down for some time.

The Maude Ellen Oil Co.'s No. 1, Section 28-3s-21, Neal Dome, in Uinta County, is drilling again and is bottomed at 1,465 feet, and is showing traces of oil and gas. It is believed in close proximity to the first sand in the Pennsylvanian. The Western Venture Corp.'s No. 1 Spahr, Section 8-5s-21, Dog Valley structure in Uintah County, is drilling at around 600 feet. The Crescent Oil Syndicate's No. 1 McCarthy, Section 27-21-19, Crescent area in Grand County, set the 10-inch at 1,601 feet and is drilling. It is bottomed in the Mancos shale which has been showing considerable gas, and the Dakota is expected at around 2,100 feet. The Navajo Petroleum Co.'s No. 1 State, Section 2-20-21, in Grand County, which has been shut down for two months by cold weather, is running casing at total depth of 2,845 feet to shut off cavy ground.

COLORADO

The Vineland district southeast of Pueblo continues to occupy the first place in the Colorado news with the activity on the increase and a score of wells going down. Drilling progress is rather slow and it is reported efforts are being made to bring the operators into an agreement to drill in at approximately the same time. Nobody knows what may be expected and a few dry holes at the start would dampen the enthusiasm necessary to finance the large number of wells being located or started. The operation extends out several miles in every direction from the discovery and there is little surface geology to indicate the trend. Reports from Pueblo are that the Continental Oil Co. has made a deal with the Vineland Oil Co. to complete the discovery well, No. 1 Shaw, NW NW Section 3-22-63, which has been standing for several months at 1,190 feet with less than 600 feet of casing in the hole and with oil standing approximately 1,040 feet. Some water is coming in from upper horizons which were not successfully shut off when the well was drilled and the operators have been very anxious to have the well completed and tested. Confirmation of the Continental report is not available in Denver as R. S. Shannon, who is in charge, is at Pueblo. It is known the Continental has been keeping in close touch with the operation and is reported to have acquired some leases.

The Sundance Oil Co.'s No. 1 Oliver-Lubers, SW cor. SE Section 35-21-63, in which former governor O. H. Shoup is interested, commenced spudding on March 19. This well is about a mile to the east and a little to the north of the discovery. The Christy-McCormick Oil Corp.'s No. 1 Mannerich, NW SW Section 34-21-63, half a mile north of the discovery, struck a gas pocket at 540 feet this week which threw mud 40 feet over the top for a few minutes. It was soon exhausted and the well is drilling below 550 feet. The Christopher Oil Syndicate's No. 1 Stanbeck, SW cor. NW Section 18-22-62, four miles southeast of the discovery, is drilling below 650 feet and is one of the deepest wells in the field. The Christy-Frantz Corp.'s No. 1 Vey, C SW NW Section 13-22-63, is drilling at 550 feet, and the Security Oil Trust's No. 1 Bush, NW NW Section 14-22-63, is drilling at 350 feet, C. W. Sheffer's No. 1 State-Oliver-Lubers, NW SE Section 4-22-63, is drilling below 350 feet, and G. E. Stevenson's No. 1 Isis, SW NE Section 1-23-63, is drilling below 100 feet. Windle Brothers' No. 1 Alber, NE cor. SW Section 6-22-63, and No. 1 Dunn, NW cor. Section 11-22-63, are rigged, but have not yet commenced spudding. Same firm's No. 1 Bergerman, NE cor. NW Section 5-22-63, is rigging up, and the Christy-Frantz Corp.'s No. 1 State, SW NW Section 16-22-63, is ready to spud. The Nordic Oil Syndicate's No. 1 Carr, C SW SW Section 13-22-63, is drilling at 235 feet.

New Operations

The Amarillo Production Co. in which O. E. Hermann and Joseph Minnick, of Texas, are interested, have contracted with Henry Dickason, for a well to the top of the red beds on SW NW Section 35-22-63, and is moving in a machine.

A group of Wichita, Kans., men headed by D. E. Wakebridge, has contracted with A. B. Christy for two wells in the W½ SE Section 2-22-63 and E half NW Section 18-22-63. The first will be started at once. The Giant Ledge Oil Co. is moving in a spudder for a well on NW cor. SW Section 4-22-63, and the Apex Syndicate, in which Roy L. Ragan and D. C. Williams, of Pueblo, are interested, has let a contract to E. A. Lamb for a well in the SW NW Section 35-21-63, and equipment has started moving in. The Brad-Shu Oil Co.'s No. 1 Randall, NW cor. SW Section 1-22-63, has purchased a rig from the Florence Drilling Co., and is moving in. The Pueblo Chief Oil Co. is moving in for its No. 1 Section 35-21-63, to start by April 5. Contract was given R. D. Howells, of Fort Collins. New locations being made are Cooperative Oil Co.'s No. 1, NW Section 27-21-63; G. & L. Oil Co., in the E. half NE Section 27-21-63, and Milner, and others, NE SW Section 17-21-63 on the Sanford land.

Moffat Dome

In Moffat County, the Texas Production Co.'s No. 11 Knowlton, SE cor. Section 33-5n-91, on the Moffat Dome, is bottomed at 4,370 feet in the Morrison and fishing for tools. The 8¼-inch was set at 4,343 feet. It is reported water was encountered in the Morrison, though not in large quantities. Another string will be run on top of the Sundance and cemeted before drilling in. No. 10 Knowlton, the first test on the Moffat Dome to the Sundance, had production in that horizon, but was troubled with water. It was believed, though it was not certain, that water was coming from the Morrison. On account of the condition of the hole, it was decided to start a new test with a rotary to explore thoroughly the horizons below the Dakota and this operation was undertaken in No. 11 Knowlton. The only other well drilling on the Moffat Dome is the Texas Production Co.'s No. 5 Wick, Section 10-4-91, which is drilling at 4,564 feet with the Sundance as the objective. On the Ilee Dome, Thomas McLaughlin and others' No. 1 Williams, NW SW Section 2-3n-92, which has been idle at 3,255 due to the bad weather, is resuming this week. The Midwest Refining Co.'s No. 24-SD Parkinson, SE NW Section 22-4-92, is fishing for bit and a total depth of 3,001 feet, and its No. 7-M Parkinson, NW NW Section 23-4-92, is in the Morrison sand at 3,407 feet and fishing for tools with 2,500 feet of oil in the hole. The Texas Production Co.'s No. 36 Lloyd, SE cor. Section 21-4-92, is drilling at 3,435 feet in the Morriosn where it has a show of oil.

In Routt County, the Midwest Refining Co. is reported moving in a rig on snow sledges for a test on the Chimney Creek structure, north of Tow Creek, where a well was drilled several years ago with encouraging shows, but which did not go to the Sundance. The Texas Production Co.'s No. 6 Quaintance-Hocking, SW NE Section 18-6n-86, Tow Creek, is bottomed at 2,586 feet and will be put on the pump. It is estimated good for 40 barrels from the shale. This company's No. 4 Belle Dennis, Sundance sand test, has shown no change for several weeks, cable tools being set up to change over from rotary.

Wellington Dome

In Larimer County, the Continental Oil Co.'s No. 3 Mitchell, SE NE Section 6-9n-68, Wellington Dome, is drilling at 3,260 feet. Same company's No. 1 Fleming, SE NW Section 6-9n-68, is ready to spud. This well is west of the center of the structure, one-fourth of mile north and west of No. 1 Mitchell, a big gas well, and three-fourths of a mile south of No. 1 Buckeye, the discovery well. This area has not been drilled as the title was in litigation until recently the Supreme Court decided in favor of the present holders. A well here will mean another extenion of the proven area. The Five Square Oil Co.'s No. 1-A State, SW W Section 16-4n-69, Berthoud Dome, is drilling at 3,100 feet and showing a little gas, but not in as large quantities as in the other well drilled by the company a little farther to the north. The Poudre River Oil Co.'s No. 1 Warren, NE cor. Section 33-8n-69, near Fort Collins, a Pennsylvanian test which has been drilling for 3 years, is bottomed at 3,599 feet in the Pennsylvanian lime, and underreaming the 4¾-inch to set at approximately 3,400 feet. It has been through several sands showing a little saturation. The Dakota sands which are productive at Fort Collins and Wellington, come to the surface a few miles west of the Warren well.

In Fremont County, the Continental Oil Co.'s No. 5 D. F. Hall, NW SE Section 35-18-70, is spudding at 80 feet, and the St. Mary's Oil Co.'s No. 3 Beltramo, SE SE Section 2-19-70, has commenced spudding.

The Ruby Hill Oil & Gas Co.'s No. 1 Braden, SE cor. Section 24-4s-69, Jefferson County, is drilling at 1,285 feet in hard rock, the horizon not being indentified but believed to be Benton or Fox Hills.

C. E. Johnson, and others' No. 1 McFadden, Section 18-3n-70, Lyons townsite, Boulder County, is drilling at 259 feet in second member of the Ingleside, and looking for a shale break. Showings of oil have been encountered in the last 30 feet.

In Montrose County, the Uncompahgre Oil & Gas Co.'s No. 1, Section 27-50-10, is bottomed at 1,840 feet in hard rock and is lowering casing. In Huerfano County, the Parker Club, Inc., No. 1, Section 4-28-68, Badito-Alamo Dome, joint with the Kinney-Coastal Oil Co., is drilling at 1,620 feet in shale, having passed through the igneous formation which appears to have been a stringer and of no consequence.

Douglas Creek Dome

A new location was announced this week for a test to be drilled on the Douglas Creek Dome in Rio Blanco County, 20 miles southeast of th Rangely Structure, by the Douglas Creek Syndicate, in which Dean E. Winchester and J. E. McLeod, geologists of Denver, are interested. The well has been spotted on the Carl H. Helman permit in the NE cor. SE Section 6-3s-101. It will drill for oil in the shale, but may be carried to the Dakota, expected at around 4,000 feet, and the Morrison and Sundance.

In Mesa County, the High Line Oil Syndicate's No. 1 Peerless, NE cor. Section 23-8s-104, is running 500 feet of 10-inch casing to shut off surface water which broke in from behind the 12½-inch. Total depth is 2,058 feet. This well, in which the Peerless Oil Corp. has an interest, was drilled to the present depth more than a year ago and had good showings of oil and gas in the Frontier. A reorganization has taken place and the new syndicate formed to complete the well. J. W. Ady, Jr., of Colorado Springs, and Salt Lake City parties are interested. It was drilled to the present depth with a rotary, but a change over to cable tools has been made. This operation is one that will be closely watched as the structure is well-defined. The Midwest Refining Co. once held considerable acreage on the structure and started the well now drilling, but title difficulties caused it to withdraw. Since then, the titles have ben cleared up and the permits extended.

WYOMING

Unfavorable weather conditions have continued to hold up operations in Wyoming though the state appears to be coming out from under the spell of cold. Salt Creek was completely isolated for two days, a flood at Greybull did considerable damage, drilling crews at the Carter camp on Billy Creek were marooned, transportation between Casper and Rawlins was suspended for two days, and wildcats generally were at a standstill.

The situation cleared sufficiently the past few days, however, for better reports to be received from the Carter Oil Co.'s No. 1 State, SW SW Section 16-48-82, Billy Creek Dome, in Johnson County, which at last reports was showing oil that indicated the opening of a new pool. The results so far are rather disappointing and the prospects for finding oil in the Wall Creek on the flanks down from the big gas are not as encouraging as at first. The well was drilling with a rotary when at 3,210 feet the core began showing saturation. The hole was carried down to 3,240 feet. At the top of the sand it showed for 3,000,000 feet of gas. When the tools were pulled the pressure cleaned the hole and the well flowed about 70 barrels. However, the oil was very black, dead, and of only 20 degrees gravity. After the storm had passed and the tankage was up, it was swabbed and made 60 barrels in 12 hours without lowering the fluid which stood 700 feet in the hole. The tools were run to clean out, but did not get below 3,190 feet on account of cavings. Eighteen feet of cavings were drilled out and the hole filled with fluid, dead oil and water, and the gas was exhausted. It is probable if it does not show up better when cleaned to bottom it will be drilled down to test the lower horizons.

Big Horn County

In Big Horn County, the Prairie Oil & Gas Co.'s No. 1 Chilcote, Section 35-56-95, Little Sheep Mountain, a test to the granite, cemented the 8¼-inch at 2,690 feet in the Deadwood. J. E. Scanlon's No. 1, Lot 16, Section 19-51-92, a deep test in the Torchlight Field, is drilling at 2,800 feet. It topped the red beds at 2,555 feet. The Cody Petroleum Co.'s No. 1, NW SW 27-57-96, Cowley Dome, shut down after spudding. The Gross Gas Co.'s No. 1, NE Section 23-56-97, Byron Dome, is bottomed at 3,865 feet and fishing for tools. It is carrying the 6¼-inch with hole full of water.

In Park County, the Midwest Refining Co.'s No. 1 Kirk. Section 23-58-98. Frannie Dome, is shut down at 1,490 feet waiting for cement to set, and its No. 36 Rosenberg, SE NW Section 25-58-98, is drilling at 1,273 feet in shale.

In Hot Springs County, the Texas Production Co.'s No. 1, Section 23-45-100, Skelton Dome, is still shut down at 1,950 feet due to bridges being washed out and delay in receiving supplies. McPherson Oil Co.'s No. 1, Section 2-44-96, Little Sand Draw, is drilling below 3,500 feet and carrying the 6¼-inch. The Midwest Refining Co.'s No. 1, Section 35-22-115, Waterfall Dome, in Lincoln County, is drilling again and is at 2,585 feet in hard brown lime. The Circle Oil Co.'s No. 1, NE Section 17-27-113, La Barge district, in Sublet County, is preparing to resume at 1,015 feet after being shut down for the winter, and J. E. Nottingham's No. 1, Section 22-27-113, is running the 12½-inch at 320 feet. In Uinta County, the California Co.'s No. 1 Union Pacific, Section 7-17-116, Muddy Creek Dome, is drilling at 2,964 feet in white sand.

IDAHO

Eastern Idaho, which has been under the eyes of some of the major companies recently, probably will be given an extensive play the coming summer if the Federal Government's policy concerning prospecting permits does not cause the operators to hold back. The California Co.'s No. 1 Sorensen, SE NW SW Section 33-3n-41e, Meadow Creek Struc-

ture, in Bonneville County, is shut down at 2,001 feet on account of the weather. The Idaho-Oregon Petroleum Corp.'s No. 1, Section 33-9n-5w, on the property of the Idaho Canning Co. in the town of Payette, which has been shut down at 1,180 feet, expects to resume shortly. This is near a well drilled several years ago for water which is reported to have encountered gas at 1,400 feet. The Great West Oil Co.'s No. 1, Section 34-7s-46, Afton structure, near the Wyoming-Idaho boundary, in Caribou County, was drilling at 2,640 feet at last reports. Norton Brothers, No. 1, Section 19-10s-37, Bannock County, on the Arimo structure, is waiting casing at 1,830 feet. It reported a show of gas at 1,802 feet and a sand is expected at 2,105 feet. The Gem State Petroleum Co.'s No. 1, NW Section 2-11s-33. Arbon Valley Structure. Powers County, is drilling at around 3,000 feet. This well was started in 1924 and drilled to 2,313 feet. Operations were resumed about a year ago.

MONTANA

Owing to bad weather conditions, the Sunburst Field saw its first completion the past week for 1929. This was the drilling well in Section 27-34-2, being put down by Roy C. Tarrant and is a gasser. Other wells are drilling in that field and completions should be had at a normal rate in the near future.

ROCKY MOUNTAIN PRODUCTION
Daily Average Runs Week Ended March 23

WYOMING	
Salt Creek	34,220
Big Muddy	2,340
Grass Creek	2,250
Elk Basin	710
Ferris	30
Rock River	2,340
Lance Creek	260
La Barge	1,740
Poison Spider	1,330
Oregon Basin	2,810
Osage	620
Lander	450
Byron	30
Lost Soldier	3,250
Simpson Ridge	50
Dutton Creek	50
Rex Lake	120
Hamilton Dome	620
Greybull	...
Total Wyoming	53,220
MONTANA	
Cat Creek	1,420
Kevin-Sunburst	5,300
Pondera	3,400
Total Montana	10,120
COLORADO	
Florence	1,049
Moffat	1,044
Fort Collins	2,711
Iles Dome	1,618
Rangely	100
Tow Creek	491
Boulder	25
Total Colorado	7,038
NEW MEXICO	
Rattlesnake	1,138
Hogback	520
Artesia	947
Cap Rock	332
Table Mesa	...
Total New Mexico	2,937
Total Rocky Mountain	73,315

SOUTHWEST TEXAS

(Continued from Page 52)

ing location south of Johnson City to start drilling by April 15.

Caldwell County

Adams & Lyles' No. 2 F. M. Branyon, J. R. Miller Survey, is location 450 feet north line, 150 feet east line.

Cranfill & Reynolds' No. 2 Northcut is moving in derrick.

Cranfill & Reynolds' No. 1 Hanson, James Hinds Survey, is location 150 feet SE cor.

Morgan-Duke's No. 2 Cora Malone, A. Floyd Survey, is location 300 feet southwest of No. 1.

Gulf Production Co.'s No. 8 M. Tiller is rigging up 300 feet west of No. 3.

Gulf Production Co.'s No. 8 Carter, G. Hinds, Survey, is erecting derrick 320 feet north of No. 4.

Gulf Production Co.'s No. 9 Carter, G. Hinds Survey, has derrick up 325 feet north of No. 7.

Gulf Production Co.'s No. 9 W. L. Smith, A. Floyd Survey, is rigging up.

Humble Oil & Refining Co.'s No. 2 Wright is drilling at 990 feet in shale.

Humble Oil & Refining Co.'s No. 1-C J. R. Tiller is building derrick.

Humble Oil & Refining Co.'s No. 3-A J. R. Tiller is location.

Humble Oil & Refining Co.'s No. 1 Clyde Smith is location.

Humble Oil & Refining Co.'s No. 7-B Moses & Baggett is drilling at 2,541 feet in Del Rio.

Humble Oil & Refining Co.'s No. 6-B Moses & Baggett is drilling at 2,180 feet in shale and boulders.

Humble Oil & Refining Co.'s No. 5-B Moses & Baggett is at 2,526 feet in Buda.

Humble Oil & Refining Co.'s No. 1 B. Johnson, James Hinds Survey, has set surface casing at 40 feet.

Humble Oil & Refining Co.'s No. 3 Hansen, James Hinds Survey, is building derrick 440 feet south line, 150 feet east line.

Humble Oil & Refining Co.'s No. 2 Hanson, James Hinds Survey, is building derrick 150 feet SW cor.

Humble Oil & Refining Co.'s No. 2 Briscoe, James Hinds Survey, is rigging up.

Humble Oil & Refining Co.'s No. 1 Briscoe, James Hinds Survey, is at 442 feet in sand rock.

Lutex Oil, Inc.'s, No. 4 Wilson, A. Floyd Survey, has set 36 feet of 10-inch casing and is drilling at 80 feet.

Shell Petroleum Corp.'s No. 6 Cora Malone, A. Floyd Survey, is drilling out plugs at 2,305 feet.

Shell Petroleum Corp.'s No. 4 New, James Hinds Survey, is waiting on orders.

Shell Petroleum Corp.'s No. 3 New, James Hinds Survey, 340 feet north of No. 2, is rigging up.

Shell Petroleum Corp.'s No. 2 New, James Hinds Survey, 340 feet north of No. 1, is moving in rig.

Shell Petroleum Corp.'s No. 1 New, James Hinds Survey, 150 feet south and west lines, is building derrick.

Gonzales County

Empire Gas & Fuel Co.'s No. 2 Norwood, Winslow Turner Survey, is location 600 feet northwest of No. 1.

Karnes County

Townsend is making location for test 4½ miles northwest of Runge and east of San Antonio River.

Kendall County

A. D. Gibbs' No. 1 A. J. McCrocklin, 6 miles southeast of Sisterdale, is moving in tools.

Refugio County

Houston Gulf Gas Co.'s No. 2 Rooke, 700 feet north of No. 1, is location.

Houston Gulf Gas Co.'s No. 1 L. M. Rogers, J. Powers Survey, is location 233 feet east line, 606 feet south line.

Houston Gulf Gas Co.'s No. 1 N. B. Cummins is location 150 feet NW cor.

Houston Gulf Gas Co.'s No. 7 Shelly is drilling at 1,800 feet.

Milam County

Rogers-Heep's No. 1 Mrs. J. B. Duncan has erected 112-foot derrick.

Nueces County

Kelly's No. 1 F. P. Zoch is location 7 miles southwest of Corpus Christi.

Webb County

G. C. Salley's No. 1 Puig, Carter-Pinkton tract, has spudded in and is standing at 1,576 feet.

Zapata County

T. P. Morgan's No. 1 Hinnant, Survey 74, is location.

Humble Field—Duval

Humble Oil & Refining Co.'s No. 15 Kohler, Survey 401, located 825 feet east line, 165 feet north line, has derrick; No. 16 Kohler, Survey 114, located 225 feet south line, 165 feet west line, is location (location changed); No. 17 Kohler, Survey 399, located 165 feet north and west lines, is drilling at 992 feet; No. 18 Kohler, Survey 402, located 165 feet south and east lines, is rigging up; No. 19 Kohler, Survey 424, located 165 feet west line and north line, at 1,831-36 feet tested gas on drill stem test; No. 20 Kohler, Survey 251, is location 165 feet north line, 2,475 feet east line; No. 21 Kohler, Survey 396, is location 545 feet east line, 495 feet north line.

Driscoll Field

Robert Driscoll's No. 15 Driscoll, Survey 448, has set 10-inch casing at 208 feet.

Schoolfield & O'Byrne Pool

Magnolia Petroleum Co.'s No. 1 Hahl, Survey 250, Block 25, located 150 feet north line, 750 feet west line, is rigging up; G. M. Partee's No. 1 Moody, Survey 60, located 150 feet north and west lines, is rigging up. Sun Oil Co.'s No. 3 Norton, Survey 250, Block 19, located 750 feet east line, 150 feet north line, is rigging up. S. & O. Oil Co.'s No. 2 Bowe, Survey 250, Block 21, located 220 feet east line, 660 feet south line, at 2,382 feet is coring deeper; No. 2 Hahl, Survey 250, Block 22, is location 220 feet north line, 960 feet west line; No. 3 Hahl, Survey 250, Block 22, is location 220 feet north line, 660 feet west line. Onyx Oil Co.'s No. 4 Krauter, Survey 250, Block 20, located 220 feet south and west lines, has sand at 2,374-76 feet and standing.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, located 150 feet north and east lines, is drilling at 4,270 feet. Randado Oil Corp.'s No. 35 Palacious, Survey 291, Block 2, located 150 feet south line, 450 feet east line, is moving on.

Henne-Winch & Fariss Field

A. L. Kitselman's No. 1 Lopez, Survey 255, Block 6, located 289 feet north line, 300 feet west line, is drilling at 2,070 feet with sand at 1,943-67 feet; No. 1 Holbien, Survey 3, Share 3, Block 9, located 450 feet north line, 150 feet west line, is drilling at 2,050 feet. The Texas Company's No. 1 D. Vela, Survey 582, Share 4, located 1,300 feet west line, 150 feet south line, has sand at 2,122-26 feet and is drilling at 2,150 feet.

Schott Field—Webb

Livingston & Payne's No. 1 Guerra-Ochoa, Survey 58, located 917 feet east line, 470 feet south line, is moving on. Laredo Oil Co.'s No. 14 Killam Survey 457, has derrick up.

Albercas Field

Sun Oil Co.'s No. A-12 Yeager-Strohman, Share 5, located 1,950 feet north line, 150 feet west line, has sand at 2,153-55 feet and is standing. Rycade Oil Corp.'s No. 8 Yeager-Strohman, Share 5, located 1,950 feet north line, 150 feet west line, is standing at 2,145 feet.

Aviator or Bruni Tracts

Aviator Gas Co.'s No. 2 Bruni, Survey 2083, is location 1,120 feet east line, 1,170 feet south line.

Carolina-Texas Field

A. G. Deck's (Miller-Daniel's) No. 1 de la Garza, Survey 48, Block 27, located 150 feet north and east line, tested salt water at 2,638 feet and is drilling deeper. W. R. Shankle's No. 1 Webster, NE SE Survey 684, located 150 feet south and west lines, at 3,038 feet is preparing to set casing and is waiting on water. The Texas Company's No. 1 Benavides, NW SE Survey 683, located 150 feet north and west lines, is drilling at 3,026 feet.

Magnolia-Cole Field

Cole Petroleum Co.'s No. 67 Benavides, Survey 412, Block 12, located 313 feet east line, 160 feet north line, is standing at 38 feet. Houston Oil Co.'s No. D-4 Benavides, Survey 753, Block 13, is location 160 feet south line, 822.5 feet east line; No. D-17 Benavides, Survey 753, Block 5, is location 160 feet south and west lines. Magnolia Petroleum Co.'s No. 1 Benavides, Survey 697, Block 10, located 150 feet north and east lines, has sand at 2,330-36 feet and set casing; No. 1 King-Benavides, Survey 694, Block 12, is location 150 feet south and east lines; No. 1 J. G. Valdez, Survey 754, Block 15, is location 150 feet south and west lines.

Simms Gas Field

Simms Oil Co.'s No. 4 Dinn, Survey 66, is location 660 feet south line, 150 feet east line.

Cole Gas Field

O. W. Killam's No. 4 (1) Bruni, Survey 5, Block 2, located 150 feet northwest lines, 86 feet southwest lines, is ready to spud in; No. 7 Bruni, Survey 3, Block 4, is moving on.

Jennings Field—Zapata

O. W. Killam's No. 12 Cuellar, Cerrito Blanco grant, 1,215 feet southwest lines, 1,170 feet southeast lines, is drilling at 1,300 feet; No. 3 Hinnant, Survey 74, located 1,980 feet west line, 1,470 feet south line, is drilling at 1,470 feet. South Texas Production Co.'s No. 4 Jennings, Cerrito Blanco grant, 6,900 feet southeast lines, 8,300 feet southwest lines, 1,667 feet is fishing for slip.

Somerset Field—Atascosa

W. R. Hamilton's No. 15 T. R. Hugh J. Sharp Survey No. 518, is skidding d rick 300 feet east of No. 14.

Yoast Field—Bastrop

Atlantic Oil Production Co.'s No. Yoast, A. Garcia Survey, is drilling 1,379 feet in Serpentine topped 1,341 fe Sun Oil Co.'s No. 1 E. E. Barnett, L. Cunningham Survey, 870 feet southe lines, 150 feet northeast lines, is drilli at 2,075 feet in Georgetown topped 2,0 feet. The Texas Company's No. 4 Yos A. Garcia Survey, is location 300 fe east of No. 3.

Somerset Field—Bexar

Schimmel Production Corp.'s No. 1 F. Gayle, C.E.P.I.&M. Survey, Block 2, location 250 feet west line, 895 feet sou line; No. 1 J. Frees, same survey a block, is location 250 feet east line, 8 feet south line; No. 2 Frees is locati 679 feet north of No. 1.

Dobrowolski Field

F. H. Eckert's No. 3 Dobrowolski, S tion 52, Block 4, located 300 feet south No. 1, is drilling in rock at 300 feet.

Gas Ridge Field

Medio Oil Co.'s No. 9 Cohen, 500 f southeast of No. 7, is shut down at 4 feet.

Dale Field—Caldwell

The Texas Company's No. 2 J. Moo J. Gilbert Survey, is location 600 f northwest lines, 1,600 feet southwe lines.

Luling Field

United North & South Developme Co.'s No. 1 G. C. Gideon, Miles Dyk Survey, 880 feet north line, 320 feet we line, is drilling at 3,000 feet.

Joe Bruner Pool

Tips de Armond's No. 2 Carter, G ren Hinds Survey, 170 feet west line, 1 feet north line, is drilling at 1,005 f showing some gas. Buchanan and othe No. 1 Trap Briscoe, P. B. McCear Survey, 150 feet south and east lines, at 24 feet waiting on rotary. E. R. Bra and C. O. Miller's No. 2 R. W. Cart Gerren Hinds Survey, 150 feet north a west lines, has derrick up. C. E. Ellze No. 1 Taylor set surface casing at feet and is standing. Forest Oil Co No. 1 J. H. Fleming, A. Floyd Surve 150 feet northeast lines, 75 feet southea lines, at 2,730 feet is waiting on ceme Golden West Oil Co.'s No. 3 Malone, Floyd Survey, 450 feet northwest a northeast lines, is shut down; No. B Wilson, A. Floyd Survey, 150 feet nor and east lines, at 2,340 feet is trying sidetrack collapsed casing at 2,318 fe

Gulf Production Co.'s No. 3 W. Allen, Gerren Hinds Survey, is at 2,7 feet; No. 4 W. O. Allen, 300 feet e of No. 3, at 2,740 feet is in Edwa waiting on cement; No. 5 R. W. Cart 300 feet south of No. 1, is drilling plug at 2,673 feet; No. 6 R. W. Cart Gerren Hinds Survey, 300 feet west No. 5, is at 2,446 feet in chalk wi strong oil and gas showing; No. 7 R. Carter, Gerren Hinds Survey, 300 f east of No. 4, has derrick up.

No. 4 J. J. Davis, A Floyd Survey, 1 feet east line, 350 feet north of No. is fishing at 2,695 feet; No. 1 M. Tiller, Gerren Hinds Survey, 150 feet cor., 150 feet north line, is drilled cement at 2,741 feet, and swabbing and salt water; No. 7 M. J. Tiller, feet east of No. 6, is drilling out pl at 2,751 feet; No. 2 J. D. Wright, G ren Hinds Survey, 300 feet north of 6, at 2,680 feet in drilling out plugs; 3 J. D. Wright, 150 feet south and w lines, is cementing at 2,671 feet; No. J. D. Wright, 300 feet north of No. is drilling at 2,310 feet; No. 5 J. Wright is drilling at 2,664 feet in of Edwards.

T. C. Hadley's No. 1 Merriweath topped chalk at 2,264 feet and is drilli Humble Oil & Refining Co.'s No. 1 L. Hanson, James Hinds Survey, 450 f south line, 750 feet east line, at 2,7 feet cored Edwards saturated with o No. 4 W. O. Allen, Gerren Hinds Surv 300 feet east of No. 2, 150 feet no line, at 2,733 feet is standing 1,400 f in oil; No. 5 W. O. Allen, Gerren Hi

Survey, 431 feet north line, 760 feet west line, at 2,752 feet has fluid in hole.

No. 6 W. O. Allen, Gerren Hinds Survey, 150 feet north line, 868 feet south line, at 2,752 feet is swabbing with 2,000 feet of oil in hole; No. 7 W. O. Allen is drilling at 2,726 feet in Georgetown; No. 4-A Moses & Baggett, 300 feet west of No. 1, has derrick up; No. 6-A Moses & Baggett, Gerren Hinds Survey, 150 feet east line, 1,158 feet south line, has set casing at 2,659 feet; No. 7-A Moses & Baggett, 450 feet south and east lines, is drilling in Del Rio at 2,558 feet; No. 1-B Moses & Baggett, Samuel Shupe Survey, 150 feet south line, 695 feet east line, is in Edwards at 2,672 feet; No. 3-B Moses & Baggett, Samuel Shupe Survey, 150 feet east line, 1,050 feet south line, has derrick up; No. 4-B Moses & Baggett has derrick up 1,350 feet south line 150 feet east line.

No. 2-A J. R. Tiller, 300 feet north of No. 1-A, has derrick up; No. 2-B J. R. Tiller, 150 feet east of road, 219 feet north line, has derrick up; No. 6 J. B. Tiller, Gerren Hinds Survey, 150 feet north line, 750 feet west line, is in Edwards at 2,753 feet bailing; No. 7 J. B. Tiller, Gerren Hinds Survey, 450 feet west line, 150 feet south line, is at 2,729 feet, total depth; No. 1-A J. R. Miller, James Hinds Survey, 150 feet west line, 1,050 feet south line, has derrick up; No. 1-B J. R. Miller, has derrick up; No. 1 Wright at 2,688 feet is waiting on cement; No. 4 J. J. Davis, A. Floyd Survey, 300 feet north of No. 2, 150 feet east line, is at 2,700 feet showing oil but does not flow.

C. E. Lange's No. 1 Kate Colding, A. Floyd Survey, 150 feet northwest lines, 112 feet northeast lines, at 2,716 feet is waiting on pump. Luling Oil & Gas Co.'s No. 1 G. R. Carter is drilling in rock at 120 feet. Rydal Oil Corp.'s No. 1 J. M. Hanson, James Hinds Survey, 150 feet south and east lines, is location. Shell Petroleum Corp.'s No. 1-B Carter, Gerren Hinds Survey, 150 feet south and west lines, has set casing at 2,678 feet; No. 3 Moses, A. Floyd Survey, 150 feet south line, 450 feet east line, at 2,706 feet is rigging up to pump; No. 5 Malone, A. Floyd Survey, 300 feet east of No. 1, at 2,693 feet put on beam to test, may plug back to chalk.

No. 1 W. L. Smith at 2,696 feet is reaming to set casing at 2,693 feet; No. 2 F. Tiller, Gerren Hinds Survey, 450 feet east line, 150 feet north line, at 55 feet is moving in rotary; No. 6 Floyd Tiller, Gerren Hinds Survey, 150 feet south line, 1,050 feet west line, is drilling in Edwards at 2,688 feet; No. 8 F. Tiller, Gerren Hinds Survey, 300 feet west of No. 6, is coring at 2,675 feet in Georgetown; No. 6 R. W. Malone, A. Floyd Survey, is location 700 feet south and east lines.

Sun Oil Co.'s No. 6 Malone, A. Floyd Survey, 300 feet southeast of No. 4, is running casing at 2,264 feet. The Texas Company's No. 1 R. W. Carter, Gerren Hinds Survey, 150 feet south and east lines, at 650 feet in new hole, first one lost at 1,703 feet, is trying to sidetrack boulder; No. 5 Merriweather, A. Floyd Survey, 150 feet northeast and southeast lines, at 650 feet is to shoot with 240 quarts. Towns & Porter's No. 5 Hickman, Gerren Hinds Survey, 300 feet east of No. 4, is swabbing and preparing to test cement.

Sullivan Field—Gonzales

Indian Petroleum Co.'s No. 1 Karnstadt, Lot 5, located 450 feet northwest lines, 150 feet northeast lines, is drilling at 4,000 feet. The Texas Company's No. 1 J. E. Lamkin, Winslow Turner Survey, is location 800 feet northwest lines, 200 feet southwest lines.

Luling Field—Guadalupe

A. B. A. Oil Co.'s No. 4 Britton Harris is shut down at 1,250 feet repairing boilers. Magnolia Petroleum Co.'s No. 9 W. R. Shanklin, Harriett Cottle Survey, SW cor., is drilling at 2,115 feet.

Agua Dulce Field—Nueces

Agua Dulce Oil & Gas Co.'s No. 1 Otto Wolters, Section 34, Benton's Pasture, is drilling at 1,150 feet. R. & G. Corp.'s No. 1 Brown, George H. Paul Subdivision, Section 87, is location; No. 1 E. W. Perkins, W. W. Wright Survey, 150 feet west line, 1,920 feet south line, is drilling at 1,150 feet; No. 2 Ed Allen, Lot 5, Section 6, about 1,900 feet east of No. 1, has derrick up.

Kingsville Field—Kleberg

Humble Oil & Refining Co.'s No. 5-B Dennett, Section 38, Block 19, located 400 feet north of No. 1, is location; No. 4 Flato, Section 40, Block 10, located 250 feet east line, 450 feet north line, is drilling at 5,129 feet.

Saxet Field

Saxet Gas Co.'s No. 5 Dunn is location 1,500 feet southwest of No. 1 Dunn, discovery well.

Refugio Field—Refugio

Benedum & Trees' No. 4 Claude Heard, 600 feet south of No. 3, is location. Houston Oil Co.'s No. 5 Wilson Heard, 300 feet west of No. 4, is coring at 3,600 feet; No. 10 Rooke producing gas well at 3,500 feet is being deepened. Houston Gulf Gas Co.'s No. 8 James Agnes Lambert is location; No. 7 Fannie Heard has set surface casing at 500 feet; No. 4 J. M. O'Brien, Survey 4, south central, at 2,420 feet is not yet on bottom; No. 1 Fox is drilling at 3,900 feet. Mission Drilling Co.'s No. 1 J. E. Fox heirs, townsite tracts, is rigging up; No. 3 Rogers estate, 1,250 feet west of No. 2, is drilling at 2,250 feet.

Oiguter Oil Co.'s No. 1 Ryals, townsite tracts, has set and cemented surface casing at 430 feet. Refugio Development Co.'s No. 1 City of Refugio in street lease between Blocks 12 and 13, in center, has spudded in. Saxet Gas Co.'s No. 6 Claude Heard, 600 feet south of No. 4, is drilling at 2,000 feet.

San Patricio County

Spencer & Rhoades' No. 2 J. M. Bennett, A. S. Taft Survey, 900 feet west line, 400 feet south line, tested dry at 2,290 feet and is drilling deeper.

LA.-ARK. WILDCATS

(Continued from Page 50)

Company's two previous Ashley County, Arkansas, tests were in when they were abandoned and which was reported as igneous rock. With a surface elevation of 95 feet the Mississippi wildcat topped the Nacatoch, or Monroe gas rock at 3,366 feet, 286 feet lower than it was found in the O'Bryen well 8 miles west.

Dry in Drew County

Ohio Oil Co. made its first test on the Jerome Lumber Co. well in Section 13-15-4, Drew County, Arkansas, dry at 2,506 feet. In White County, northeastern Arkansas. Letona Syndicate's No. 1 Letona Townsite, Section 35-8n-8w, has suddenly appeared with reports of an oil show in sand from 1,522-30 feet, a small show of gas at 1,738 feet, a hole full of salt water from 1,810 feet and coring at 2,008 feet. Empire Gas & Fuel Co. and Cosden & Co. are reported buying rather freely around the location. Similarly, Independent Oil & Gas Co. which has a cable tool job under way on the Banks & Teague farm in Section 6-16-27, Madison County, in the northwestern part of the State, is reported buying freely between the location and the Alma, Kibler and Mansard Prairie gas districts, northeast of Fort Smith, some 75 miles southwest.

Coates and Falvey are rigging up to drill No. 1 McDuffy in Section 32-19-17, Union County, and J. W. Olvey has rig up for No. 1 Cottrell in Section 22-19-17, both near the Louisiana line west of Junction City, Ark.-La. In the Champagnolle district, Lion Oil Refining Co. has taken over Charles Thornton and others' No. 1 Stowe, Section 4-17-13, 2 miles east of production and about half way between production and Joe Hurley's well on the Arkansas Timber Co. land in Section 29-16-12, Calhoun County, and will be drilling soon. The only news out of Mississippi, aside from Atlantic's proposed abandonment on its well with The Texas Company on the Houston land in Section 30-11-6, Sharkey County, was a reported location by Frank Henderson and others on the Askew lease, part of a 10,000-acre block in Hinds County, the location being in Section 17-6n-4w.

Caddo Parish Show

The scouts appeared to be considerably interested in a drill stem test by D. C. R. Oil Co. at 2,412-14 feet on No. 1 Hunter in Section 17-19-14, Caddo Parish, 12 miles north of Shreveport and about 6 miles east of D. C. Richardson's last activities in the Blanchard district. The well had a show of gas and salt water at 1,970 feet and is reported to have an oil sand at the deeper level and was in sandy shale showing oil at 2,422 feet.

Walker and others have returned to the old Antrim well at Plain Dealing in Bossier Parish on which they have been working at intervals for the past two years, and are reported washing to bottom, presumably in advance of making more hole at 2,985 feet, where it has been shut down for two months. Jack Moffatt abandoned No. 1 Ball in Section 29-7-1w Grant Parish and is moving in to deepen the old Ohio Oil Co.'s 3,200-foot test in Section 28-22-16, Caddo Parish, taken over by Humble Oil & Refining Co. and R. W. Norton. Moffatt's well was on a machine high and was abandoned as a dry hole at 2,004 feet about 400 feet below where it was predicted an oil sand would be found. Carter & Collins, from whom Moffatt took over this well, and some acreage, are nevertheless going ahead with No. 1 Hardtner & Tannehill, a similar location in Section 9-6-1w, and were drilling sand at 400 feet.

Woodley & Collins' No. 1 Harp, Section 22-22-7, Morehouse Parish, was dry on drill stem test from 2,512-22 feet after a small show of water in the gas rock, and was coring at 2,600 feet. Phillips and others' No. 1 School fee, Section 16-16-4, Morehouse Parish, claimed a show of oil at 2,800 feet and gas at 3,100 feet and is drilling sandy shale at 3,312 feet. W. C. Wyche, reported buying for Magnolia Petroleum Co., has taken considerable acreage in the south half of Township 22, Range 3 and 4w, Union and Claiborne Parishes, at a dollar an acre. Magnolia already has about 1,500 acres in that vicinity, Pure Oil Co. 2,600 acres and Standard Oil Co. 1,000 acres. It all fits in with reports of recent activities in that part of the State in which acreage is being blocked on commercial leases bearing no drilling obligations.

A. H. Tarver renewed most of the leases on the Long-Bell Lumber Co.'s land in Sabine Parish, Zwolle district, which he had let go, and has location in the NE cor. SE NE Section 30-8-13, east of R. L. Gay's producer, which he is obligated to drill before April 15. With this well and other proposed tests there will be a half dozen wells going in this district before May 1.

NORTH LOUISIANA

Bossier Parish

Nell & Lanier, shut down at 50 feet for the last two months on No. 1 Biedenharn, Section 23-21-14, have resumed operations and with 10-inch set at 100 feet are drilling at 775 feet. Walker and others' No. 1 Antrim, Section 28-20-13, is washing to bottom again after being shut down for three months, total depth 2,985 feet.

Caddo Parish

D. C. R. Oil Co. is drilling shale at 2 330 feet on No. 1 Hunter, Section 17-19-14. Nemours Corp. set 84 feet of 10-inch on No. 1 Ellerbe, Section 18-15-12.

DeSoto Parish

P. J. Becker has rig up for No. 1 Tull, Section 23-12-15. Benedum & Trees Oil Co.'s No. 1 Mahoney, Section 22-14-12, is drilling at 2,200 feet and No. 1 Nicholson, Section 2-15-14, at 2,150 feet. Luke Case's No. 1 Boatright, Section 3-10-13, cemented 6-inch at 2,904 feet. Magnolia Petroleum Co. is drilling at 150 feet on No. 4 Fortson, Section 4-12-11. R. O. Roy's No. 1 Sample, Section 1-13-14, is drilling at 2,375 feet.

East Carroll Parish

Palmer Corp. is drilling sand rock at 1,542 feet on No. 2 O'Brien, Section 6-19-11.

Grant Parish

Jack Moffatt's No. 1 Ball, Section 29-7-1w, is shut down for orders in gumbo at 2,009 feet, contract depth. Carter & Collins' No. 1 Hardtner & Tannehill, Section 9-6-1w, set 42 feet of 10-inch and is drilling sand at 400 feet. L. C. Swope has shut down No. 7 fee, Section 18-9-1e, at 100 feet on account of litigation.

Monroe District

Morehouse—Woodley & Collins' drill stem test of No. 1 Harp, Section 22-22-7, at 2,508 feet was dry and they are drilling gas rock at 2,590 feet.

Ouachita Parish—Phillips and others' No. 1 School fee, Section 16-16-4, claiming a show of oil at 2,800 feet and gas at 2,100 feet, is drilling sandy shale at 3,312 feet.

Lincoln Parish

V. E. Shaw is drilling No. 1 Voss, Section 1-20-3, at 1,075 feet.

Natchitoches Parish

S. D. McDaniels is coring at 2,320 feet on No. 2 Clark & Morse, Section 23-5-6, and Robeline Oil & Gas Co. is drilling gumbo at 2,800 feet on No. 1 Cassady, Section 7-8-9.

Richland Parish

Austin & McDonad, who made location for four wildcat wells in the northern end of the district a month ago, have begun drilling the first of the series, No. 1 Millsaps, in Section 17-17-6, on which they have reached surface casing depth. Richland Operating Co.'s No. 1 S. R. Humble, Section 30-16-7, is drilling at 2,113 feet and Wilson and others are drilling No. 1 Buie, Section 17-15-7, at 1,608 feet.

Sabine Parish

R. L. Gay tested dry with a small show of gas and salt water at 2,560 feet on No. 2 Bowman-Hicks, Section 14-7-14, and has derrick pattern on location for No. 3, offsetting it in the same section. No. 1 Long-Bell, Section 26-8-14, is rigging up and No. 1 Sabine Lumber Co., Section 13-7-14, is drilling at 2,801 feet.

EAST TEXAS

Marion County

Trimount Petroleum Co. is coring No. 1-A Mebane & Stills, N. Gupton Survey, at 2,320 feet.

Shelby County

Gulf Refining Co.'s No. 1 Carraway, in the J. H. Patterson Survey, is drilling at 3,329 feet.

ARKANSAS

Ashley County

J. G. Marcum's No. 1 DeYampert, Section 5-19-14, is coring at 3,282 feet and The Texas Company's No. 1 Keifer, Section 11-18-4, is drilling a hard rock at 3,402 feet.

Columbia County

Helena Oil & Gas Co. is drilling No. 1 Pickler, Section 19-19-22, at 1,810 feet in shale and boulders.

Drew County

Ohio Oil Co. ran testing tool at 2,506 feet on No. 1 Jerome Lumber Co., Section 13-15-4, and failed to get a show of anything.

Logan County

Arkansas-Louisiana Pipe Line Co. (formerly Arkansas Natural Gas Corp.) No. 1 Hanna, Section 26-7-23, has rig up to drill; No. 1 Parks, Section 26-8-24, in hard sand at 5,005 feet.

Ouachita County

J. E. Crosbie's No. 1 Goodwin, Section 13-15-16, Smackover, is reaming to bottom, total depth 2,831 feet. Gulf Refining Co. is drilling No. 9 Goodwin, Section 32-15-15, at 2,608 feet. Magnolia Petroleum Co. has rig up for No. 1 Wilson, Section 25-15-18. McDonald Brothers' No. 1 Wilson, in the same section, is drilling at 2,846 feet.

Union County

Bell and others' No. 1 Terrell, Section 27-18-14, is shut down at 2,594 feet. Bush and others are coring No. 1 McDonald, Section 11-17-18, at 2,721 feet. W. M. Coats has rig up for No. 1 McDuffy in Section 32-19-17, and E. L. Foster's No. 1 Smith, Section 8-16-17, is shut down at 100 feet. J. O. Moore's No. 1 Union Sawmill, Section 11-18-12, is on a rock at 1,608 feet. J. W. Olvey has rig up for No. 1 Cottrell, Section 22-19-17.

White County

Letona Syndicate's No. 1 Letona Townsite is running core barrel at 2,008 feet after drilling oil sand at 1,522-30 feet, testing a small show of gas at 1,738 feet and sand at 1,810 feet, which filled the hole with salt water.

MISSISSIPPI

Hinds County

F. N. Handerson and others have location, not checked, in Section 17-6n-4w, for No. 1 Askew.

Monroe County

Arkansas Natural Gas Corp.'s No. 1

Rye, Section 22-15-17, is reaming at 2,983 feet, total depth 3,074.

WEST TENNESSEE

Decatur County

Chester County Oil & Gas Co.'s No. 1 Montgomery was drilling green sandy shale at 815 feet and Standard Oil Co. of Louisiana was in alternating streaks of hard and soft lime at 620 feet on No. 1 Wyatt, 7 and 3 miles, respectively, of Decatursville on the Old Dunbar structure.

KANSAS FIELDS

(Continued from Page 48)

Schmidt, SW cor. NE, Section 22-31-3, is dry and abandoned at 3,188 feet. Trees Oil Co.'s No. 1 Hittle, SE cor. SW NE, Section 21-31-4, made 120 bbls. from sand at 2,378-90 feet. The Texas Company's No. 5 Hittle, NE cor. NW SE, Section 21-31-4, was completed for 100 bbls. in sand at 2,346-55 feet. Barnsdall Oil Co.'s No. 1 Clabough, SE cor. NE NE, Section 19-31-5, has been abandoned at 600 feet.

Roth & Faurot's No. 1 Bement, NW cor. Section 20-31-5, was completed for 500,000 feet of gas in sand at 590-98 feet. Lewis Production Co.'s No. 2 Pierce, SW cor. NW SE, Section 30-31-6, made a 10-bbl. well in sand at 2,923-55 feet. Roth & Faurot's No. 1 Wilcoxson, SW cor. Lot 2, Block 46, Musgrove Addition to Arkansas City, Section 22-32-4, was completed for 1,750,000 feet of gas in sand at 2,942-54 feet. Krow White Oil Co.'s No. 1 McErwin, C NW SE, Section 4-32-5, is dry and abandoned at 3,630 feet.

J. A. Hull's No. 5 Bartlow, SW cor. NW NW, Section 19-32-5, made 125 bbls. from sand at 2,971-3,035 feet. Roth & Faurot's No. 1 Redings, SE cor. NW, Section 31-32-6, has been abandoned at 3,505 feet. Gypsy Oil Co.'s No. 1 Jennings, NW cor. SW NW, Section 8-33-3, is making 200 bbls. from sand at 3,493-3,502 feet. Barnsdall Oil Co.'s No. 1 Kemp, SE cor. SW SE, Section 7-34-3, is dry and abandoned at 3,814 feet. Kentucky Nitrogen & Oxygen Co.'s No. 2 Silliliman, CSL NW NE, Section 13-34-6, has been abandoned at 600 feet.

Elk County

J. C. Wyatt's No. 1 Baker, SE cor. NE SW, Section 10-31-10, Moline Townsite Pool, is rigging up. Blaudell Drilling Co.'s No. 1 Rettig, NE cor. Section 29-31-10, is preparing to deepen from 1,553 feet.

Franklin County

Smith, Trice & Fisher's No. 1 Owens, CEL SE, Section 17-16-18, is dry and abandoned at 1,250 feet in Wilcox sand.

Greenwood County

Empire Oil & Refining Co. has the rig on the ground for No. 1 Laird, NE cor. SW, Section 21-23-11. No. 12-A Ott, NE cor. SW NW, Section 26-22-12, has been completed for 50 bbls. in sand at 1,708-41 feet. Amerada Petroleum Corp.'s No. 6 Luthi, SW cor. NE SW, Section 29-22-13, made 75 bbls. from sand at 1,666-92 feet. Chriss Sheedy and others' No. 10 Green, NE cor. Section 11-23-9, made 125 bbls. from sand at 2,379-2,406 feet.

The Texas Company's No. 2 Edwards, NW cor. SE, Section 21-23-11, is producing 450 bbls. from sand at 1,876-1,971 feet. Haverhill Petroleum Co.'s No. 18 Inthurn, NW cor. SW SE, Section 4-23-13, came in for 35 bbls. in sand at 1,606-39 feet. Ritchie & Moore's No. 1 Marshall, NE cor. NW, Section 33-24-9, is dry and abandoned at 2,409 feet. Henderson & Holden's No. 3 Gaffney, NE cor. SW NE, Section 7-24-4, is dry and abandoned at 1,931 feet.

Parrish and others' No. 1 Maran, NW cor. Section 15-24-12, has been abandoned at 1,715 feet. Sheedy and others' No. 1 Grossarth, SE cor. SW, Section 12-25-12, is dry and abandoned at 1,757 feet. Reed & Wilson's No. 2 Olsen, C SE NW, Section 28-26-9, made 1,000,000 feet of gas from 1,040 feet.

Jefferson County

Northern Counties Oil & Gas Co.'s No. 1 Edwards, NE cor. NW NW, Section 13-9-19, has been abandoned at 3,440 feet.

Labette County

Cromwell and others' No. 1 Hornback, SW cor. NE NE, Section 1-33-17, is dry and abandoned at 1,375 feet.

Marion County

Youker and others' No. 1 Halbeck, SE cor. SW NE, Section 10-17-4, is spudding.

Nemaha County

Nemaha Oil & Gas Co.'s No. 1 Myers, NW cor. Section 19-3-11, has been abandoned at 3,250 feet.

Osage County

Baker and others' No. 1 Lewis, C SE SE, Section 3-15-15, is dry and abandoned at 1,700 feet. West and others' No. 1 Bailey, SW cor. NW, Section 27-15-16, has been abandoned at 1,340 feet. Mull-Vit Development Co.'s No. 1 Neil, SW cor. NW NE, Section 8-17-17, has been abandoned at 2,738 feet.

Pottawatomie County

J. J. Crawford's No. 1 St. Marys, SW cor. Section 11-10-12, has been abandoned at 2,195 feet.

Wabaunsee County

Doric Oil Co.'s No. 1 Jones, NE cor. SW, Section 24-11-10, has been abandoned at 1,530 feet. Eskridge Oil Co.'s No. 1 Henderson, NE cor. SW NE, Section 15-13-12, is dry and abandoned at 3,675 feet.

Wilson County

West & Williams' No. 1 Smally, C NE NE, Section 28-30-17, has been abandoned at 1,400 feet.

Woodson County

Peerless Oil Co.'s No. 2 Hughes, CNL NE NE, Section 23-26-14, has been abandoned at 1,302 feet. No. 11 Lauber, CWL NE NE, Section 23-26-14, was completed for 200 bbls. in sand at 1,203-77 feet.

OKLAHOMA FIELDS

(Continued from Page 48)

Co.'s No. 5 Harding, NW cor. SE NW, Section 18-8-5, made 2,765 bbls. in Misener sand at 4,156-88 feet.

Skelly Oil Co. and Margay Oil Co.'s No. 2 Linger, NW cor. NE, Section 18-8-5, made 480 bbls. from Hunton lime at 4,163 feet. No. 3 Linger, NE cor. NW NE, Section 18-8-5, was completed for 425 bbls. in Hunton lime at 4,161 feet. Phillips Petroleum Co.'s No. 3 Hudson, NW cor. NE NW, Section 19-8-5, made 470 bbls. from Hunton lime at 4,151-57 feet. Sunray Oil Co. and Cal Cul Oil Co.'s No. 1 Davis, SW cor. SE SW, Section 19-8-5, has been abandoned at 4,466 feet. Magnolia Petroleum Co.'s No. 2 Cherry, C N half S half NE, Section 26-7-4, flowed 350 bbls. from sand at 4,326-45 feet.

No. 3 Cherry, CNL SE NE, Section 26-7-4, St. Louis Pool, pumped 12 bbls. at 4,415 feet after plugging back from 4,625 feet. Sinclair Oil & Gas Co.'s No. 2 Nesbit, SE cor. NW, Section 18-7-5, St. Louis Pool, made 285 bbls. from Simpson sand at 4,100-68 feet. Shell Petroleum Corp.'s No. 2 Smith, NW cor. SW NW, Section 21-7-5, is dry and abandoned at 4,576 feet. Shaffer Oil & Refining Co.'s No. 4 Tolon, SE cor. SW, Section 30-7-5, made 205 bbls. from Hunton lime at 3,740-3,995 feet.

Seminole County

Carter Oil Co. made location for No. 2 B. Larney, NW cor. SW NW, Section 26-7-6, Little River Pool. Independent Oil & Gas Co. and Mid-Kansas Oil Co.'s rig is under construction for No. 1 Little, SW cor. NW NE, Section 26-7-6. T. B. Slick is erecting the rig for No. 2 Cudjo, SW cor. NW NW, Section 26-7-6. No. 4 Wood, NE cor. NW SW, Section 26-7-6, is rigging up. Independent Oil & Gas Co. is building the rig for No. 2 Carpenter, SE cor. NE NE, Section 27-7-6. Gypsy Oil Co. has the rig on the ground for No. 1 Thomas, SE cor. NW, Section 9-6-7.

Carter Oil Co. and others' No. 2 Gillim, SW cor. SE, Section 13-9-5, Earlsboro Pool, is dry and abandoned at 4,415 feet. Gypsy Oil Co.'s No. 2 Wisner, SW cor. NE, Section 13-9-5, has been abandoned at 4,634 feet. Magnolia Petroleum Co.'s No. 3 Gillim, SE cor. NE SW, Section 13-9-5, is dry and abandoned at at 4,363 feet. Skelly Oil Co.'s No. 4 Shepard, NE cor. SW NW, Section 6-9-6, was completed for 535 bbls. in Wilcox sand at 4,335-53 feet.

Barnsdall Oil Co.'s No. 7 Coker, NW cor. SE SW, Section 11-8-5, made 605 bbls. in sand at 4,215-27 feet. Empire Oil & Refining Co.'s No. 3 Cluck, SW cor. NW SE, Section 11-8-5, Carr City Pool, was completed for 2,030 bbls. in sand at 4,247-60 feet. Sinclair Oil & Gas Co.'s No. 2 Harjo, NW cor. SW SE, Section 11-8-5, made 685 bbls. in sand at 4,216-29 feet. Gypsy Oil Co.'s No. 2 Fife, NW cor. SW NW, Section 14-8-5, drilled to 4,427 feet, plugged back to 4,145 feet and pumped 50 bbls. Gypsy Oil Co.'s No. 4 N. Barkus, SW cor. Section 6-8-6, Mission Pool, made 830 bbls. from sand at 4,616-20 feet.

The Prairie Oil & Gas Co.'s No. 3 Melton, SW cor. NW NW, Section 6-8-6, has been abandoned in Wilcox sand at 4,473-75 feet. C. L. McMahon and others' No. 2 Harjo, NW cor. SE, Section 7-8-6, was completed for 667 bbls. in Wilcox sand at 4,256-79 feet. Minnehoma Oil Co.'s No. 2 Neal, NW cor. Section 7-8-6, made 150 bbls. from sand at 4,606-07 feet. Shell Petroleum Corp. and Marland Oil Co.'s No. 2 Herndon, SE cor. NW NE, Section 7-8-6, is dry and abandoned at 4,040 feet.

McCulloch Oil Co.'s No. 1 Davis, SE cor. NW, Section 20-8-7, is dry and abandoned at 4,383 feet. Shell Petroleum Corp.'s No. 1 Jeffries, NE cor. SE SW, Section 32-8-7, East Little River area, was completed for 8 bbls. at 3,375 feet after plugging back from 4,616 feet. Carter Oil Co.'s No. 2 Factor, SW cor. SE NW, Section 26-7-6, Little River Pool, made 7,000,000 feet of gas in sandy lime at 3,212-36 feet. Independent Oil & Gas Co. and Sands Petroleum Co.'s No. 1 Reed, SE cor. NE NW, Section 26-7-6, has been completed for 59,000,000 feet of gas in sand at 3,125-43 feet.

Pontotoc County

W. R. Ramsey is erecting the rig for No. 1 Kerr, NE cor. SE, Section 1-4-7. Hughes and others made location for No. 3 Gann, SE cor. NW, Section 15-4-7. Ogg & Hill and others' No. 1 Boley, SW cor. Section 29-5-5, swabbed 90 bbls. from Viola lime at 2,475-2,579 feet. Homaokla Oil Co.'s No. 2 Ritchie, SW cor. NE SE, Section 1-4-7, made 40 bbls. from sand at 2,020-49 feet. Hughes and others' No. 2 Gann, NW cor. NE SW, Section 15-4-7, was completed for 10 bbls. in sand at 1,768-72 feet.

Stephens County

Shaner and others' rig is up for No. 3 Brymer, CEL SW NE, Section 31-1-8w. Pace and others' No. 1 Petty, SW cor. NW SW NW, Section 17-2s-7w, is rigging up. No. 1 Bristowe, NW cor. SW, Section 18-2s-7w, is drilling at 300 feet.

Magnolia Petroleum Co.'s No. 1 School Land No. 4, SW cor. SE, Section 13-1s-9w, has been abandoned at 3,889 feet. Pace and others' No. 1 Woodhouser, SE cor. SW SE, Section 36-1s-8w, is dry and abandoned at 2,289 feet. Atlantic Oil Producing Co.'s No. 2 Taylor, SW cor. NW NW, Section 12-1s-4w, made 125 bbls. from sands at 3,020-3,678 feet. Magnolia Petroleum Co.'s No. 2 Rivire, SE cor. NE NW, Section 24-1s-4w, is a dry hole at 4,655 feet.

Pace and others' No. 1 Medley, SW cor. NW NE, Section 2-2s-8w, is pumping 26 bbls. from sand at 2,186-98 feet. Magnolia Petroleum Co.'s No. 1 West, SE cor. SW, Section 33-2-5w, has been abandoned at 4,440 feet. Pelwin Oil Co.'s No. 1 Baker, SW cor. NE NW, Section 36-2s-6w, has been abandoned at 2,001 feet.

Tulsa County

Mitchell County Gas Co.'s No. 1 Barnett, SE cor. SW NE SE, Section 1-18-12, is a machine rigging up. William Wood Syndicate's No. 5 Franklin, C SE SW, Section 36-19-11, is dry and abandoned at 2,212 feet. C. O. Buckles' No. 2 Brown, C NW SW, Section 7-17-13, has been abandoned at 1,899 feet.

Wagoner County

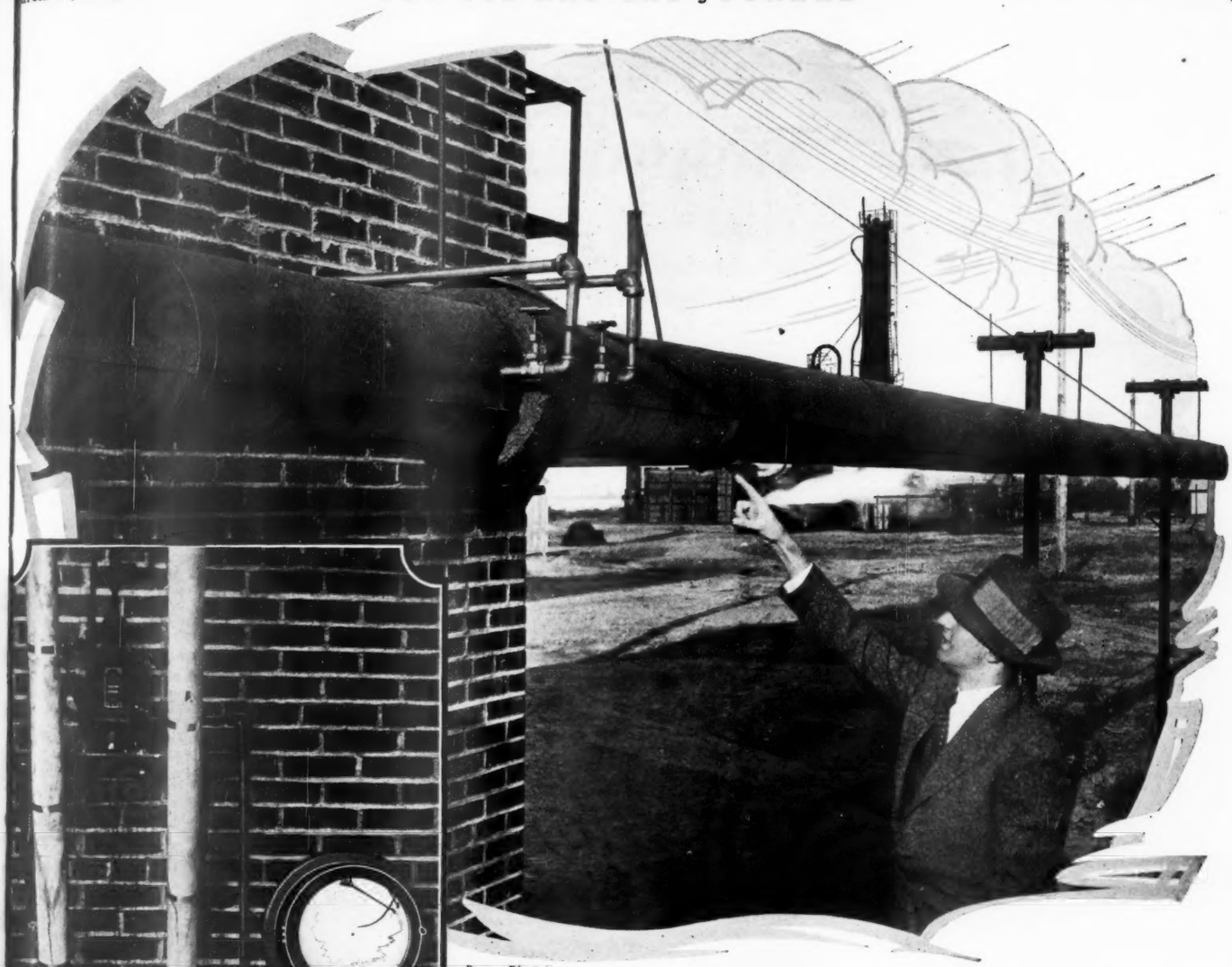
F. L. Beam and others' No. 1 Ford, NE cor. SE, Section 24-16-17, is dry and abandoned at 1,485 feet.

The production of some of the Greater Seminole pools by companies and leases on Thursday, March 21 follows:

Little River Pool

Company, Farm—	Location	Wells	Prod.
Amerada:			
Nitey	2- 7-6	2	680
Amerada-Wilcox:			
Fore	35- 8-6	2	595
Barnsdall:			
Cotcha	23- 7-6	2	780
Hotulke	22- 7-6	3	306
Walker	4- 7-6	1	457
Blackwell:			
Baker	11- 7-6	4	1,410
Nitey	35- 8-6	5	875
Talley	14- 7-6	4	680
Bryan & Emery:			
Walker	4- 7-6	1	13
Carter:			
Cotcha, M.	23- 7-6	3	130
Cudjo, L.	23- 7-6	2	60
Fish	36- 8-6	4	805
Harjo, C.	11- 7-6	3	3,035
Harjo, M.	13- 7-6	4	1,885
Jackson	11- 7-6	4	1,465
Larney	24- 7-6	4	2,405
Lena	10- 7-6	1	1,135
Moore	11- 7-6	2	265
Tewee	14- 7-6	6	1,315
Thomas	11- 7-6	1	590
Wilson	12- 7-6	1	260
Champlin:			
Tewee	14- 7-6	2	1,024
Continental:			
Cosar	36- 8-6	7	1,387
Cosar, M.	25- 8-6	1	456
Continental & Fisher:			
Milsey	11- 7-6	2	565
Empire:			
Charty	24- 7-6	1	0
Coker	13- 7-6	2	1,190
Sandlin	3- 7-6	1	20
Gypsy:			
Brown, C.	33- 8-6	2	342
Brown, M.	33- 8-6	1	800
Campbell	33- 7-6	2	22
Conard	22- 7-6	2	465
Cosar, W.	36- 8-6	2	150
Cotcha	23- 7-6	6	1,955
Denmark	11- 7-6	4	1,482
Hulhoke	14- 7-6	10	1,300
Mungee	1- 7-6	1	7
Payne	5- 7-7	1	15
Pottie	35- 8-6	4	1,170
Renton	11- 7-6	3	382
Independent:			
Carpenter	27- 7-6	1	1,095
Davis, R.	13- 7-6	4	2,185
Tewee	14- 7-6	6	1,891
Williams	15- 7-6	1	340
Independent & Highway:			
Harris	23- 7-6	8	1,935
Independent & White Eagle:			
Davis	2- 7-6	4	390
I. T. I. O.:			
Campbell	1- 7-6	1	150
Dugan	35- 8-6	3	311
House, M. A.	1- 7-6	1	47
House, W. E.	1- 7-6	1	11
House, "B"	2- 7-6	4	1,012
Hull	26- 8-6	3	222
Jackson	1- 7-6	3	678
McCulla	1- 7-6	3	426
Nitey	2- 7-6	6	167
Phoebe "A"	36- 8-6	2	32
Phoebe "B"	36- 8-6	3	60
Reed	1- 7-6	1	10
Soketheche	1- 7-6	3	434
Magnolia:			
Cruse	2- 7-6	4	184
Denby	11- 7-6	4	296
Harjo, A.	14- 7-6	2	138
Harjo, B.	14- 7-6	2	250
Pottle	35- 8-6	4	208
Reed, E.	31- 8-7	1	30
Reed, I.	22- 7-6	3	640
Marland & Shaeffer:			
Harrison	4- 7-7	1	407
McCulloch & Sands:			
Harrison	4- 7-6	1	7
Mid-Continent:			
Brunner	11- 7-6	4	330
Eleck	23- 7-6	1	85
Smith	5- 7-7	3	4,225
Wadsworth	36- 8-6	7	370
W. B. Pine:			
Hoyecha	26- 8-6	6	1,861
Pine-Phillips:			
Pottie	35- 8-6	1	375
Prairie:			
Chilcoat	2- 8-6	3	495
Dungan	35- 8-6	1	13
Gibson	14- 7-6	5	1,220
Harris	14- 7-6	4	830
House	2- 7-6	4	210
Johnson	24- 7-6	1	770
Lustey	5- 7-7	2	325
Moppin	24- 7-6	2	1,570
Talley	14- 7-6	4	875
Prairie & Amerada:			
Sunny	14- 7-6	6	2,565
Pure:			
Brinson	24- 7-6	3	1,581
Cotcha	14- 7-6	10	2,647
Harjo	11- 7-6	4	1,206
Hollins	11- 7-6	1	193
Reiter-Foster:			
Bunyard	14- 7-6	4	940
Jefferson	31- 7-6	1	10
Shaeffer:			
Narcombe	36- 8-6	2	190
Shell:			
Caesar	11- 7-6	1	51
Glass	26- 7-6	1	0
Hotulke	22- 7-6	4	667
Jefferies	32- 8-7	1	8
Johnson	13- 7-6	4	2,685
Sinclair:			
Blanton	11- 7-6	1	282
Cosar	30- 8-6	3	871
Haney	12-7-6	1	75
Tewee	14- 7-6	2	1,190
Sinclair & Kingwood:			
Pompey	24- 7-6	1	10
Skelly:			
Carl	14- 7-6	2	1,622
Reed	13- 7-6	2	1,200
Williams	15- 7-6	2	665
Wood	26- 7-6	1	315
Skelly & Pine:			
Coker	1- 7-6	1	737
Snowden-McSweeney:			
Tiger	13- 7-6	2	827

(Continued on next page)



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Brown Electric Flow Meter

"To measure is to economize."

Company, farm— Location	Wells	Prod.
Superior:		
Potulka 31- 8-6	1	0
Soketteche 1- 7-6	1	5
Texas:		
Brooks 25- 8-6	1	25
Coker 1- 7-6	3	235
Janey 11- 7-6	6	1,110
Texas & Independent:		
Hotulke 23- 7-6	6	1,110
Hotulke 22- 7-6	1	0
Tidal:		
House 1- 7-6	2	260
Johnson 1- 7-6	1	26
Twin State:		
Lowe ..... 25 -8-6	1	55
Total	324	82,544

Maud Pool

Company Farm— Location	Wells	Prod.
Amerada:		
Ballard 1- 8-4	1	350
Gossland 8- 8-5	3	325
Hallum 1- 8-4	4	3,845
Amerada & Barnsdall:		
Wallace 17- 8-5	1	235
Amerada & Hull:		
Green 20- 8-5	1	335
Darby:		
Ketcham 19- 8-5	1	54
Gypsy:		
Bourassa 7- 8-5	3	545
Miller 18- 8-5	5	2,677
Independent:		
Harding 18- 8-5	5	1,890
I. T. I. O.:		
State 16- 8-5	1	0
Laurel O. & G.:		
Billington 18- 8-5	2	800
Magnolia:		
Billington 8- 8-5	1	272
Marland & Shell:		
Everett 18- 8-5	1	738
Mid-Continent:		
Shelton 18- 8-5	1	225
Phillips:		
Keenan 6- 8-5	1	0
Wallace 17- 8-5	1	150
Phillips, et al.:		
Hudson 19- 8-5	3	360
Prairie:		
Campbell 18- 8-5	6	1,285
Pure:		
Lindly 18- 8-5	6	950
Urbansky 19- 8-5	1	125
Wiley 8- 8-5	4	1,520
Sinclair:		
Bellara 19- 8-5	9	1,335
Calvin 7- 8-5	1	330
Harjo 11- 8-5	2	510
Lewis 6- 8-5	2	50
Skelly & Margay:		
Lingefelt 18- 8-5	3	778
Texas:		
Calvin 7- 8-5	4	365
Tidal:		
Dunn 12- 8-4	1	75
Everett 18- 8-5	1	85
Smith 8- 8-5	1	230
Twin State:		
Calvin 7- 8-5	2	505
Wilcox:		
Smith 8- 8-5	2	650
Total	105	32,076

Mission Pool

Company Farm— Location	Wells	Prod.
Amerada:		
Rice 5- 8-6	1	215
Barnsdall:		
Coker 11- 8-5	5	3,464
Fife 14- 8-5	2	460
Carter:		
Fuswa 18- 8-6	2	560
Melisse 9- 8-6	1	620
Micco 8- 8-6	2	365
Darby:		
Judy 1- 8-5	1	105
Empire:		
Cluck 11- 8-5	3	2,171
Gypsy:		
Barkus, N. 6- 8-6	7	4,929
Barkus, S. 7- 8-6	1	225
Coker 10- 8-5	1	468
Dosar 7- 8-6	4	1,490
Hardy 7- 8-6	4	540
Harjoche 7- 8-6	3	455
Micco, L. 8- 8-6	2	90
Micco, S. 8- 8-6	1	115
Mission ..... 5 & 6- 8-6	5	2,722
Mosar 1- 8-5	3	902
Independent:		
Lawson 1- 8-5	2	1,305
Independent & Kistler:		
Payne 7- 8-5	2	980
Ind Terr Illum.:		
Simpson 10- 8-5	1	38
Tully 10- 8-5	1	0
I. T. I. O.:		
Killing 14- 8-5	1	14
Marland:		
Maines 7- 8-6	3	1,105
McMahon et al.:		
Harjo 7- 8-6	2	850
Mid-Kansas:		
Moore 7- 8-6	1	60
Minnehoma:		
Neal 7- 8-6	2	552
Pine:		
Harjo 6- 8-6	1	448
Micco 8- 8-6	1	33
Prairie:		
Billington 11- 8-5	6	3,105
Melton 6- 8-6	2	1,785
Mitchell 15- 8-5	1	140
Micco 5- 8-6	1	30
Townsend 6- 8-6	1	125
Prairie & Gypsy:		
Owens 18- 8-6	1	195
Shaffer:		
Weaver 12- 8-5	1	610
Shell & Marland:		
Herndon 7- 8-6	1	193
Shell & Papoose:		
Maines 7- 8-6	4	1,294
Sinclair:		
Bean 11- 8-5	2	495
Hardy 7- 8-6	3	778
Sinclair & Lenox:		
Judy 1- 8-5	1	125
Tidal:		
Nelly 12- 8-5	2	850
Twin State:		
Hayes 8- 8-6	2	1,960
Judy 6- 8-6	2	1,615
Ripley 12- 8-5	2	345
Total	75	29,601

Bowlegs Pool

Company Farm— Location	Wells	Prod.
Amerada:		
Roscoe 15- 8-6	7	912
Atlantic:		
Baker 10- 8-6	4	500
Fleet 23- 8-6	3	200
Grayson 13- 8-6	4	435
Jones, A. 16- 8-6	2	64
Jones, C. 9- 8-6	1	130
Barnsdall:		
McNac 28- 8-6	1	21
Murrow 11- 8-6	4	390
Carter Oil:		
Bowlegs 15- 8-6	4	535
Burden 23- 8-6	2	190
Harjoche 14- 8-6	6	540
Hilly 23- 8-6	3	180
Jones 11- 8-6	4	455
Walker 15- 8-6	4	355
Wise 23- 8-6	11	1,347
Dixie:		
Culley 11- 8-6	1	68
Empire:		
Lacy 14- 8-6	6	350
Wise 23- 8-6	2	153
Gypsy:		
Bowlegs 22- 8-6	1	60
Bradley 9- 8-6	1	2
Crumsey 10- 8-6	4	610
Grayson 13- 8-6	4	430
Harjoche 10- 8-6	3	570
Jones 11- 8-6	1	6
Walker 15- 8-6	7	280
Wise 23- 8-6	2	165
I. T. I. O.:		
Barnett 24- 8-6	2	167
Barnett "B" 23- 8-6	1	40
Billington 22- 8-6	4	301
Bowlegs 22- 8-6	9	1,243
Davis 13- 8-6	4	296
Fay 13- 8-6	9	990
Goforth 15- 8-6	12	1,318
Livingston 15- 8-6	10	1,393
Lizzie 13- 8-6	3	355
Walker 15- 8-6	8	720
Williams 12- 8-6	1	150
Wilmott 15- 8-6	4	280
Work 24- 8-6	1	21
Youngblood 24- 8-6	2	97
Magnolia:		
Davis 13- 8-6	3	432
Davis, M. 13- 8-6	1	166
Hammond 10- 8-6	8	498
Rhodes 12- 8-6	5	448
Van Buskirk 9- 8-6	3	648
McColloch:		
Bowlegs 22- 8-6	10	185
Mid-Continent:		
Baker 10- 8-6	4	312
Smith 12- 8-6	6	600
Minnehoma:		
Bowlegs 15- 8-6	3	153
Prairie:		
Gahagan 23- 8-6	3	240
Harber 10- 8-6	8	1,235
Jones 11- 8-6	4	330
Templeton 12- 8-6	5	2,050
Whitney 23- 8-6	4	400
Pure Oil:		
Reed 14- 8-6	14	2,276
Strother, "D" 11 & 14- 8-6	4	372
Strothers, "F" .. 10- 8-6	7	2,238
Shaffer:		
Lacy 14- 8-6	3	385
Shell:		
Taylor 16- 8-6	5	39
Sinclair:		
Cumsey 10- 8-6	4	700
Ellen 11- 8-6	6	443
Harjo 14- 8-6	3	452
Jones 9- 8-6	7	340
Taylor 10- 8-6	4	515
Taylor, W. 10- 8-6	3	468
Walker 22- 8-6	4	922
Slick:		
Jones 3- 8-6	1	225
Texas:		
Reed 14- 8-6	11	700
Tidal:		
Grayson 13- 8-6	4	400
Harjoche 10- 8 6	6	1,065
Total	306	35,552

Earlsboro Pool

Company Farm— Location	Wells	Prod.
Amerada:		
Anderson 15- 9-5	2	300
Cowden 4- 9-5	7	887
Rogers 3- 9-5	2	81
Amerada & Gypsy:		
Delaware ..... 13 -9-4	1	0
Amerada & Sinclair:		
Foreman 18- 9-5	1	105
Barnsdall:		
Brown 10- 9-5	4	1,390
Bruner, F. 2- 9-5	2	42
Bruner, N. 10- 9-5	3	1,198
Cudjo 14- 9-5	1	26
Davis, W. 11- 9-5	3	130
Davis, J. 11- 9-5	4	1,320
Davis, M. 11- 9-5	2	42
Gibson 9- 9-5	7	1,357
Hern 15- 9-5	1	1
Ingram 1- 9-5	8	371
Pack, S. 10- 9-5	4	120
Peter 10- 9-5	4	48
Sango 1- 9-5	2	1,517
Sebalka 15- 9-5	1	210
Sullivan, H 11- 9-5	1	6
Sull-Harjo 10- 9-5	2	32
Wasutke 12- 9-5	3	874
Burke-Greis:		
Wisner 6- 9-6	2	585
Burke-Greis & Red Bank:		
Mays 1- 9-5	1	1,035
Carter:		
Davis 13- 9-5	3	565
James 6-9-6	4	1,740
Carter et al.:		
Gilliam 13- 9-5	2	2,070
Continental:		
Kays 2- 9-5	2	39
Spencer 12- 9-5	4	565
Empire:		
Barker 12- 9-5	1	32
Edmondson 3- 9-5	3	87
Empire & Marland:		
Anderson 13- 9-5	1	342
Empire & Amerada:		
Bullock 8- 9-5	1	552
Gypsy:		
Bruner 10- 9-5	4	2,562
Carter, B. 11- 9-5	7	2,175
Earl 16- 9-5	1	0
Hunick 5- 9-5	2	1,962
Noble 12-9-5	4	1,142
Peter 10- 9-5	1	142
Sango 1- 9-5	13	2,502
State 15- 9-5	3	407
Independent:		
Bruner 10- 9-5	3	282
Sullivan 10- 9-5	1	15
Knapp 8- 9-5	4	1,890
Independent-Margay:		
Gains 11- 9-5	3	225
Magnolia:		
Anderson 18- 9-6	1	161
Bryant 9- 9-5	6	241
Cowden 9- 9-5	6	241
Dixon 12- 9-5	1	18
Edmondson 3- 9-5	1	4
Germany 30- 9-5	1	23
Gilliam 13- 9-5	20	6,208
Holmsley 11- 9-5	6	23
Hyde 13- 9-5	1	428
Ingram 10- 9-5	1	15
Lena 10- 9-5	3	58
Moore 24- 9-5	1	50
Seay 12- 9-5	9	555
Simpson 10- 9-5	4	355
Sparks 11- 9-5	6	104
Sullivan 12- 9-5	3	100
Mid-Continent:		
McCumber 9- 9-5	7	65
Rogers 5- 9-5	2	1,245
Mid-Kansas:		
Anderson 14- 9-5	2	40
Phillips:		
Dunaway 14- 9-5	1	20
Prairie:		
Baker 24- 9-5	2	90
Davis 13- 9-5	3	1,060
Graham, C. 3-9-5	2	20
Graham, O. 10- 9-5	4	1,000
Stidham 11- 9-5	9	1,705
Prairie & Whitney:		
Harjo 24- 9-5	1	0
Shaffer:		
Clark 1- 9-5	3	257
McCoy 36-10-5	1	3
Shell:		
Bayless 17- 9-5	1	17
Hearn 13- 9-5	1	121
Spencer 12- 9-5	2	1,110
Sinclair:		
Foreman 18- 9-5	1	15
Hollins 12- 9-5	1	15
Sango 2- 9-5	4	1,425
Shelly:		
Mays 1- 9-5	4	1,615
Shepard 6- 9-6	4	2,271
Spencer 12- 9-5	1	0
Shelly & Atlantic:		
Cherry 6- 9-6	4	550
Lottie 6- 9-6	2	1,672
Slick:		
James 6-9-6	2	919
Slick et al.:		
Campbell 6- 9-6	5	2,976
Superior:		
Ingram 1- 9-5	1	735
Walker 2- 9-5	2	1,535
Texas:		
Anderson 2- 9-5	8	130
Brown 10- 9-5	8	75
James 6- 9-6	2	380
Rogers 5- 9-5	5	1,490
Wilmott 10- 9-5	6	90
Tidal:		
Walker 35-10-5	3	1,545
Watkins 9- 9-5	7	1,650
Twin States:		
Barker 12- 9 5	3	40
Hern 2- 9-5	3	30
Total	301	65,249

EAST TEXAS GETTING GEOPHYSICAL PLAY

(Continued from Page 36)

is that more careful training and selection of men for this highly specialized work is imperative.

Reef Origin of Limestones

E. Russell Lloyd's work upon the coral reef origin of the Capitan limestone in West Texas seems to have started something of considerable scientific and economic importance. Papers and discussions along these lines developed one session of the convention into a coral reef symposium and the question is now raised as to whether the surprisingly high porosity of over 40 per cent in the limestone reservoir rocks of West Texas may be due in part at least to coral reef origin. Frank R. Clark suggested that surface water leaching during periods in which these beds were exposed to erosion may also have had much to do with their surprisingly high porosity.

In the consideration of the coral reef origin of productive limestone beds in West Texas, depositional effects occupied much more thought than diastrophism, and many new and interesting questions arose. Are these coral reef limestones the source beds as well as the reservoir beds? In how many fields are the limeste reservoir beds of coral reef origin? what extent have depositional irregul ities influenced the settling and dist tion of the beds? How can these fos ized and buried coral reefs be traced the geologist? Apparently this coral r idea has given the geologists much think about and to work upon in findi more oil. One prominent geologist inje ed a laugh into the situation after s of the boys had argued themselves red the face by suggesting the development special geophysical instruments to loc coral reefs instead of salt domes.

Crooked Hole Problem

Dr. Frederic H. Lahee presented admirable paper upon the crooked h problem in which he substantiated, yond any reasonable doubt, his statem that the problem of crooked holes is s ond in importance only to the problem overproduction. The principal causes crooked holes were designated as exc sive weight on the bit and the hydr licking effect of the circulating fluid rotary drilling. The enormous losses the industry that are caused by crook holes from the time the wells are be drilled to the time they are abandon were impressively set forth by Doc Lahee. Methods of drilling straight h and methods of surveying deep wells w also discussed. Doctor Lahee pointed that the only way to check the accura of deep well surveying instruments is try them out in two interfering wells. also suggested that valuable experime could be performed in deep mine sha

Other High Lights

Among the many subjects discussed side and out of the meetings were ing devices and methods of determin the true angles and directions of d detailed studies of core samples and applications of such studies in de mining the thickness and trends of pays, thickness and trend of bar streaks, casing and packer points, the application of core studies to repr suring problems and the estimation recoverable oil reserves.

Deep drilling operations in the palachian fields of Pennsylvania. Oh and West Virginia are attracting c siderable attention among the geologi Production in these fields has alwa been from comparatively shallow be Two and three thousand-foot wells h hitherto been considered deep, but in light of modern developments there probably much high priced oil and g to be had from known structures depths of from 5,000 to 7,500 feet a the companies are now locating and dr ing deep tests for such production.

The world wide extent of the sea for oil by geophysical methods was a touched upon in the informal discussio Venezuela and other South Americ countries are especially active in g physical explorations, and much work this kind is being done in Mexico. T Italian government is pursuing geophy cal work in the Po Valley. Explorati of the same kind are being conducted Germany, Russia, Rumania, Persia, A stralia, India, and Africa. Other meth are being used even more extensively combing the world's known petrolifer provinces and one is forced to won what is going to be done with the that improved methods of explorat and continually deeper drilling operati must bring forth. With national cons vation now before us, is internatio conservation only a few jumps ahead?

In the realm of pure science, growi interest was manifested in the Peru Pennsylvanian stratigraphy, the Tra Pecos section, stratigraphy and tecton in Kansas, Montana, Colorado, N Mexico, the Gulf Coast region, and A kansas. Equal interest was shown many other general and detailed proble in correlation, stratigraphy faulting, str ture, trends and effects of buried ridg unconformities, and many more subje of this general character. At the cl of the meetings, after the crowd h left, three hats were observed on otherwise lonely table with a sign re ing, "three hats without domes." E dently some types of domes are e yet extremely difficult to locate.

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Baker Cement Equipment is today marking a new era—a stride ahead in guiding, floating and cementing equipment.

Solid concrete now takes the place of cast iron. A celeron ball valve with the valve seat of the same material built into the concrete makes the valve operation positive.

Cement acts as a reinforcement strengthening the shoe or coupling.

It is much easier drilled out than cast iron.

The well is left free and clear of any iron which would interfere with further operations. Especially coring directly under the shoe.

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Baker Cement Float Collar

A solid concrete plug containing a celeron ball check valve and seat is cast and anchored in a special seamless steel coupling 16″ to 18″ in length. The celeron ball valve is positive in action. This type of float is preferred by many operators in preference to the float shoe. Although many operators when running in long strings use both the Float Shoe and the Float Collar.

Baker-Burch Cement Float Shoe

A plain Casing Shoe with a solid concrete guide-shaped plug containing a celeron ball check valve cast and anchored in rounded grooves in the Shoe.

Safer and stronger in every way than a cast iron floating plug. Easily drilled out and leaves the well free of any foreign material which would interfere with further drilling and coring operations.

Baker-Burch Side Hole Cement Float Shoe

The same as the regular Baker-Burch Float Shoe except it has side circulating holes as well as those on the bottom. The side holes insure free and easy circulation and are especially desirable when cementing long and heavy strings of casing on or near bottom.

Hundreds of successful jobs in the deepest fields in the world have proven its superiority in landing and cementing long strings.

MEN KNOWN IN OILDOM

Joseph Zeppa

Joseph Zeppa, vice president of the Macmillan Petroleum Corporation in charge of sales, was born in Piedmont, Italy, on August 2, 1893, and came to the United States at the age of 13. His elementary education was obtained in Italy and in the public schools of New York. He took night school courses in commerce, finance and accounting and later majored at Toulouse University, France.

Mr. Zeppa entered the employ of George H. Church and Shearman & Sterling, 55 Wall Street, New York, as office boy in 1910 and rose to cashier, which position he occupied in May, 1917, when he enlisted in the First United States Reserve Engineers, afterwards the Eleventh Engineers. He served in France from July, 1917, until July, 1919.

In September, 1919, Mr. Zeppa was sent to Italy by an American and British syndicate to convert a part of the government railways to oil-burning equipment, the object being to build up a larger market for Mexican crude. Upon completion of this mission Mr. Zeppa went to El Dorado, Ark., shortly after the discovery of oil there early in 1921. He became affiliated in 1922 with the El Dorado Natural Gas Company. He remained with this concern and its successors, the Natural Gas & Petroleum Corporation and the Natural Gas & Fuel Corporation as director and secretary-treasurer with an active part in their operation and management.

In April, 1928, Mr. Zeppa was made secretary and acting treasurer of the Arkansas Gas Corporation, representing the merger of the Arkansas Natural Gas Company, the Natural Gas & Fuel Corporation, the Industrial Gas Company and other properties. This merger was effected by the Cities Service Company which acquired the majority of the common stock. Mr. Zeppa also was elected secretary-treasurer of numerous subsidiaries. He resigned December 22, 1928, to become vice president of the Macmillan Petroleum Corporation with offices in Los Angeles.

Mr. Zeppa is unmarried. He works at golf when he has time and he is a member of the Shreveport Golf and Country Club, Broadmoor Golf Club of Shreveport and the El Dorado, (Ark.) Golf and Country Club.

PERSONAL PARAGRAPHS

J. A. Bearman, of Cisco, Tex., was in Tulsa during the past week.

* * *

Pat Armstrong, of San Antonio, Tex., is back from Jaurez, Mexico.

T. K. Smith, of the Chestnut & Smith Corporation, is visiting the Texas fields.

* * *

Harry W. Berdie has been appointed director of public relations for the Richfield Oil Company.

* * *

B. F. Thompson, who is drilling in Calhoun County, Texas, has just returned from a trip to Chicago.

* * *

S. D. McIlroy, president of the Dixon Creek Oil Company, of Amarillo, spent Monday in San Antonio, Tex.

* * *

J. P. Edwards has been elected secretary of the Associated Oil Company, succeeding P. G. Williams, who recently resigned.

* * *

Paul S. Ache, president of the Reiter-Foster Oil Corporation, is back in Tulsa after a two weeks' business trip to New York.

* * *

Col. T. H. Barton, president of the Lion Oil Refining Company of El Dorado, Ark., was in Fort Worth, Tex., for a day or two.

* * *

Earl Wagy, of the Standard Oil Company of California, has returned to the home office in San Francisco after a trip to Houston, Tex.

* * *

S. G. Sanderson, in charge of natural gasoline manufacture for the Gypsy Oil Company, is making a business trip to the Pacific Coast.

* * *

B. A. Hardey, executive president of the Dixie Gulf Gas Company, of Houston, Tex., visited the company's Shreveport offices during the week.

* * *

F. R. Braman, of Tulsa, steel representative of the National Tube Company, has gone to California on a two months' business trip for his company.

* * *

C. R. Virtue, of Yale, owner of the Walters Refining Company, of Walters, Okla., is a patient in the Cushing hospital, following an attack of appendicitis.

* * *

Floyd W. Mohler, Mid-Continent sales manager of the International Derrick & Quipment Company, with headquarters at Dallas, Tex., spent a few days in Tulsa last week.

* * *

Clyde Alexander, vice president and general manager of the Phillips Petroleum Company, of Bartlesville, Okla., is inspecting some of his company's properties in Texas.

* * *

R. E. Wertz, in charge of the land department of the Producers & Refiners Corporation with Tulsa headquarters, has been on business for his company in Wyoming.

* * *

L. A. Nordon, general manager of the Southern Gas Company, San Antonio, Tex., has been elected a vice president of the company, retaining also his position as general manager.

* * *

Thomas W. Masterson, Jr., geologist, has returned to San Antonio, Tex., from a trip to Houston where he was looking over oil interests. Mr. Masterson is associated with L. A. Casey.

* * *

Sidney E. Keoughan, president of the Continental Oil Company, was in California last week looking over the Continental company's wildcat at Carpenteria in Santa Barbara County.

* * *

Mr. and Mrs. J. E. Patterson and son John sailed recently from Hong Kong on the last lap of their journey home from Miri, Borneo. They will reach Petrolia, Ontario, about April 15.

* * *

R. M. Sands has been appointed assistant to President E. L. Doheny, of the Petroleum Securities Company. Mr. Doheny remains in active charge but Mr. Sands is expected to relieve him of part of the duties.

* * *

G. B. Davies, in charge of bulk sales for the Louisiana Oil Refining Corporation for several years, has resigned and will be succeeded for the immediate present by C. B. Lamason, executive assistant.

J. P. Cappeau, Sr., for many years identified with the oil industry in Pittsburgh, Pa., but more recently a resident of New York, is visiting Tulsa.

* * *

Frank J Hinderliter, of the Hinderliter Tool Company, Tulsa, was called to Williamstown, W. Va., through the death of Mrs. Hinderliter's mother, Mrs. B. F. Riggs. Mrs. Hinderliter had gone to Williamstown earlier.

* * *

H. B. Haney, formerly assistant chief engineer of the Associated Oil Company at Los Angeles, has been promoted to the position of chief engineer and has accordingly moved to the company's headquarters at San Francisco.

* * *

John McKeon, formerly vice president of the Richfield Oil Company, has returned to Los Angeles from New York where tentative plans were discussed contemplating the consolidation of several independent producing units.

* * *

Raymond F. Baker, chief geologist, and V. L. Porter, assistant to the manager of production department, The Texas Company, have been transferred from Houston, Tex., to New York City, and have left for their new headquarters.

* * *

Directors of the Richfield Oil Company of California, following the annual stockholders' meeting, elected James A. Talbot to the newly created position of chairman of the board. C. M. Fuller was advanced to the presidency of the company.

* * *

J. W. Leonard, president of the Leonard Petroleum Company of Pittsburgh, Pa., and Mrs. Leonard were in San Antonio, Tex., as guests of D. E. O'Brien, who represents the company in Texas. The Leonards are on their way to California.

* * *

Ernest E. Kells has returned to the Persian fields after seven months' furlough in Petrolia, Ontario. Mr. Kells made his first trip to Persia six years ago, at the age of 19, being one of the youngest Canadian drillers who ever went to foreign fields.

* * *

Frank B. Firman, formerly cashier of the Ohio Oil Company at Casper, Wyo., but now assistant treasurer of Ohio Oil Company with Findlay, Ohio, headquarters, spent several days in Casper recently on his way from a trip to the Pacific Coast and Salt Lake City.

* * *

R. O. Armstrong, deputy supervisor of the mineral leasing division of the United States Geological Survey, has left Casper, Wyo., on a trip to Roswell, N. Mex. Mr. Armstrong has under his supervision eastern Wyoming, Nebraska, Colorado, New Mexico, and Arizona.

* * *

Tony Statts, of Maracaibo, Venezuela, South American representative of the Fluid Packed Pump Company of Los Nietos, Calif., has been visiting the Mid-Continent offices of the company at Tulsa. He has been located in South America for the past six years.

* * *

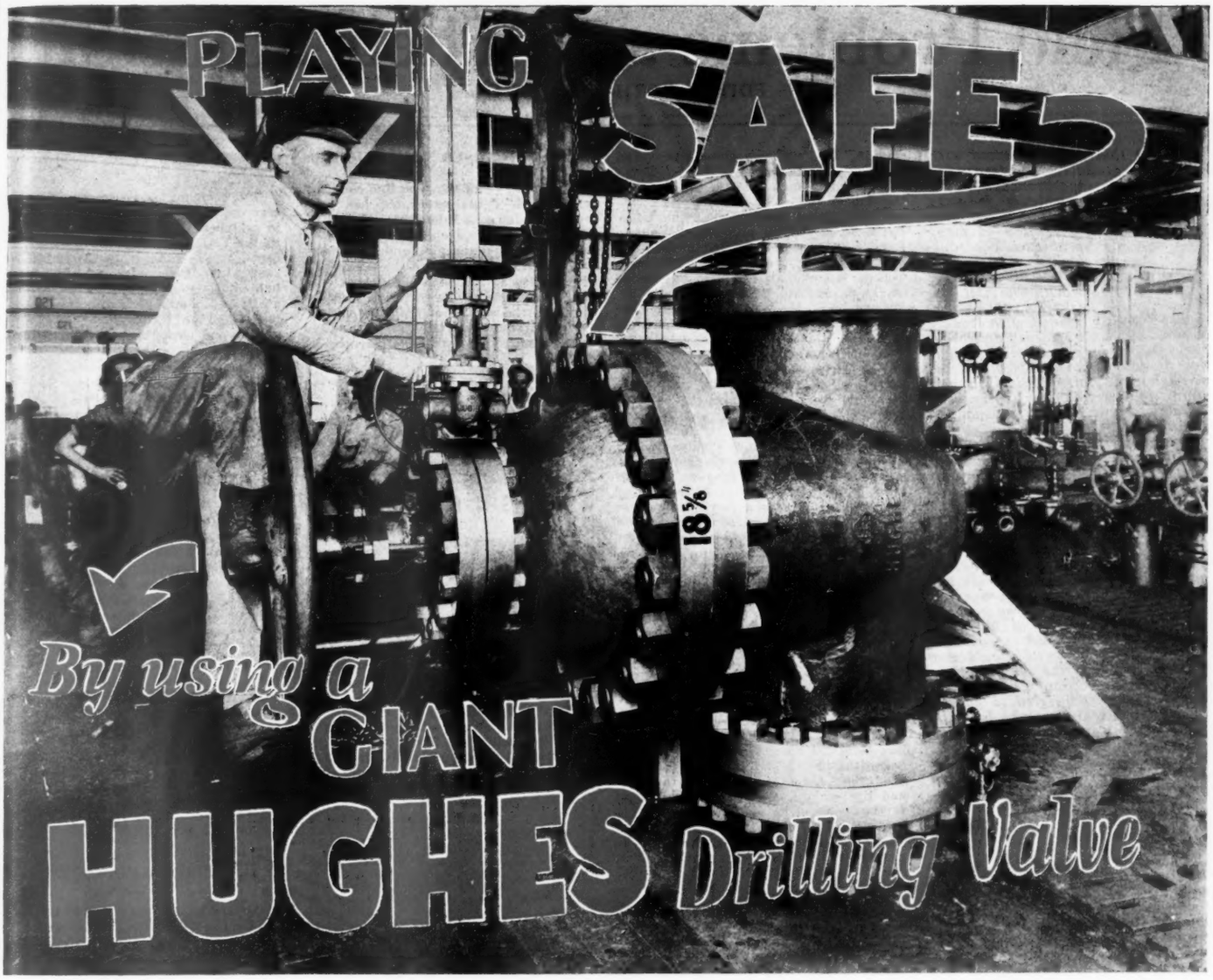
Silas M. Newton, president of the Grayburg Oil Company, left for the East after spending several days in San Antonio, Tex. He will be at the celebration of the turning on of the natural gas in one of the southern Indiana cities and is expected back in San Antonio about April 3.

* * *

L. G. Hughes, formerly head of the land department of The Texas Company at Shreveport, La., succeeding W. M. Redditt who resigned a year ago, has been promoted to be assistant division manager for the company in the Louisiana-Arkansas division. G. T. Alexander, who has been in the divisional land department for some time, is sitting in on the desk vacated by Mr. Hughes.

* * *

R. S. Ellison, vice president and general manager, Fred E. Wood, chief petroleum engineer and George H. Jacques, general superintendent of production, all of the Casper offices of the Midwest Refining Company, accompanied by H. C. Breitschneider, vice president of the company with headquarters in Denver, Colo., recently made a trip of inspection of the company's Montana and northern Wyoming properties.



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New York City

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

DOES GAS-OIL RATIO CHANGE?

Perhaps you can answer a question which has been causing some discussion among a group of oil men. As an oil pool is developed the rock pressure in the course of time is reduced. Now will the amount of gas produced with each barrel of oil in a well in this pool be just the same as at the beginning or will there be a change? And if there is a change in the gas-oil ratio will it be greater or less than it was before?—L. D. C.

As a rule in fields where gas pressure forces the oil to the wells the gas-oil ratio increases as the rate of oil production decreases, or in other words, as the gas pressure decreases; but this rule does not always hold true. There are cases on record where the gas-oil ratio has decreased as the oil production decreased. A great deal depends upon the conditions in the individual pool, the individual well, and the period in the life of the pool or individual well during which the observations are made. Experiments of the Bureau of Mines indicate that the gas-oil ratio may increase for a while, and then decrease, and then increase again to a very high figure as the well or pool approaches its economic limit. These variations are governed by critical conditions and relationships that are not thoroughly understood.

Some disagreement and much discussion may develop from such irregularities but the rule that gas-oil ratios increase as the oil production declines is generally applicable. It is reasonable to believe that the gas-oil ratio for the initial well in a field most nearly approaches the formation gas-oil ratio at first and that the gas-oil ratio tends to increase quickly from this point as production continues.

An excellent generalization upon the increase of gas-oil ratios is quoted from C. V. Millikan's article on "Gas-Oil Ratio as Related to the Decline of Oil Production," in Petroleum Development and Technology in 1926, A.I.M.E. as follows:

"An outstanding feature of the relationship of the decline of oil production and the gas-oil ratio is that the latter increases as the oil production declines. Expressed in actual decline of gas volume, the rate of decline of oil production is faster than the rate of decline of gas production. While this general relationship is the reverse of the more common belief, it should exist where gas is the only force which expels the oil from the sand. When a well is first completed the gas is under maximum pressure, and the oil must be moved the minimum distance through the sand to reach the well; here the minimum volume of gas is produced. As the well becomes older, the average distance which the oil must move to reach the well increases. The greater distance requires more work to be done and because of the smaller pressure a larger volume of gas is required for an equal amount of work so that as the oil production declines the volume of gas produced with each barrel of oil increases.

"All the data available indicate that only 15 to 25 per cent of the original quantity of oil in a sand is recovered ordinarily by our present production methods. Under these same operating conditions the rock pressure is reduced almost to or below atmospheric pressure. Therefore, the gas content of the sand must be much more thoroughly drained than the oil, possibly from 80 to 90 per cent of the original gas volume being produced. When a well is first completed the oil and gas come from the sand immediately adjacent to the well and the volume of gas per barrel of oil is the same as the original content in the sand, but as the well becomes older and the drainage territory greater the gas produced is not only that which is contained in the oil itself but also that which comes from the oil which remains in the sand."

TO PREVENT SANDING UP

One of our neighbors in the Urania Field is drilling a gas well. We understand he had about 1,000,000 feet coming through a qarter-inch choke but same immediately sanded up. The depth of the well being less than 1,500 feet. If you can give us any information as to how to bring in a small gas well of this sort without having same sand up it would be greatly appreciated, as we only require about 200,000 feet per day of this gas to run our engines.—D. H. D.

By holding enough back pressure with an orifice choke to reduce the flow of gas from such a well to 200,000 cubic feet per day the trouble from sand that you describe should be eliminated. To make sure of this you can connect in a heavy steel pressure drum about 4 feet in diameter and 8 feet long between the well head and the orifice choke on the lead line. The sand will settle in this drum and should not cause further trouble.

WANTS LEASE FORM

In your issue of February 14, page 77, we notice a reference to Provision 12 in Form B, which is the oil mining lease in use in Osage County, Oklahoma, and we will thank you to mail us a copy of this lease form if possible.—L. M. M.

The Osage County lease form to which you refer is given in "Regulations to Govern the Leasing of Lands in the Osage Reservation, Oklahoma, for Oil and Gas Mining Purposes." You can obtain a copy of this bulletin by addressing Department of the Interior, Office of Indian Affairs, Washington, D. C.

LEAD CAUSES CORROSION

For many years the pipe line company with which I am associated has been weighting down its lines where they cross river bottoms by placing castiron sleeves or shoes around the pipe and then pouring melted lead in between the sleeves and the pipe so as to fasten the sleeves onto the pipe. Considerable corrosion seems to occur on the outside of the pipe close to the lead. Can you tell me if the lead has anything to do with the corrosion.—S. D. E.

Lead is electro-negative to iron and steel and under most conditions where the metals are in contact with each other in water or in moist soil there will be set up a galvanic couple corresponding to the old galvanic battery action which is most destructive to iron and steel. It is surprising that such practice could be used for years without causing enough damage to the pipe to necessitate abandonment.

The amount and seriousness of the contact action between iron and lead depends largely upon the character of the water in which the metals are immersed. The action will be most serious in streams carrying refuse water from oil wells and wines and less serious in streams that are free from such refuse.

The stimulative effects of lead in the corrosion of iron and steel are described in United States Bureau of Mines Bulletin 233, "The Protection of Oil and Gas Field Equipment Against Corrosion," by R. Van A. Mills.

WHY IS IT CALLED THAT?

BACK TWIST

There is always a tendency on the part of the drilling cable, either wire or manila, to twist in the same direction as its lay. To overcome this action of the cable the driller, after running the tools into the hole raises them clear of the bottom. Then before clamping on he gives the cable a complete turn in the direction opposite to its lay for each 100 feet of depth. Thus, if the hole were 2,000 feet deep, he would give a right lay line 20 turns to the left. In the vernacular of the derrick floor this is a back twist. The back twist is performed with a wrench made especially for the purpose.

WHEN A ROD "HINGES"

Can you tell me what is meant when it is said that a sucker rod is "hinging?" I have heard the expression used several times.—R. A. D.

The term "hinging" has been applied to the condition in a sucker rod that results when the rod has been bent or kinked and then put back into use again. As a rule such bent or kinked rods have been straightened as well as possible before being returned to service, but rods that have been bent are never as good as before. When it is bent back, the steel does not assume its former condition. Some of the bend remains the component crystals in the steel do not adjust themselves to the compact position they formerly occupied and internal stresses are set up. The pumping action makes a hinge at the bend which eventually causes the rod to fail at that point. It is therefore imperative that sucker rod be handled carefully to avoid bending or kinking which leads to this so-called "hinging."

MISTAKE TO CEMENT TUBING

Our company is repressuring a property on which one of the pressure wells is equipped with 2-inch tubing cemented in the hole just above the oil sand. The depth of the sand is 700 feet. There is some fluid, both water and oil, in the hole and the sand refuses to take any air at 250 pounds. Can you suggest what we should do? Should we use chemical reagents to clean the well?—C. H. H.

It was a mistake to cement tubing in the pressure well and the fact that it is cemented there will interfere with cleaning the hole out and putting into good condition to take air or gas. You can run in a small size pump and empty the hole of its fluid. Then try pressuring the well to see if it will take air. If it will not take air you should try pouring in 1 or 2 drums of gasoline and then applying pressure. Emptying a hole of its fluid and introducing gasoline sometimes helps a sand to take air or gas.

It will be difficult to introduce chemical reagents into the well through 2-inch tubing and if you get the reagents in, it will then be difficult to clean the hole out properly after the reagents have done their work.

The necessity of cleaning out this well from time to time should have been considered before the 2-inch tubing was cemented in the hole. It may be possible to cut and drill this tubing out along with the cement, but the job will be difficult and costly. Another alternative is to drill a new pressure well and equip it properly. No matter what plan you follow, it is probable cementing this tubing in the well will prove to have been a costly mistake.

TROUBLE PULLING SCREENS

We are having considerable trouble in the Urania Field with pulling our screens. We find it desirable once in six months to pull our screens and clean them and we find that the wire breaks off of same and the screens stick in the casing. We have one now which we seem to be unable to pull and are told that we will have to send to Houston to get some concern who has special cutters to cut out such a screen, the expense being something like $100 per day for this work.

We would like to inquire whether there is any screen made which can be readily pulled without having to cut it out by piece. We presume that a perforated pipe would work in ordinary cases, but we have a very fine sand to contend with. If you could give us the names of manufacturers of such screen as we require as outlined above, same would be much appreciated.—M. O. C.

You are advised to use either finely slotted pipe or button pipe to meet the conditions described in your question. You can get either slotted pipe or button pipe in almost any pattern and fineness of opening that you desire. Manufacturers of this equipment are regular advertisers in The Oil and Gas Journal.

LETTERS SHOULD BE SIGNED

This department recently has received several letters which either were unsigned or which were signed with initials only. The latest of these, mailed in an envelope postmarked Maud, Okla., bears only the typewritten signature, "L. P. W." While initials only of inquirers are published, the name and address should be given in submitting questions.

BE IT CAN'T BE TOO DEEP

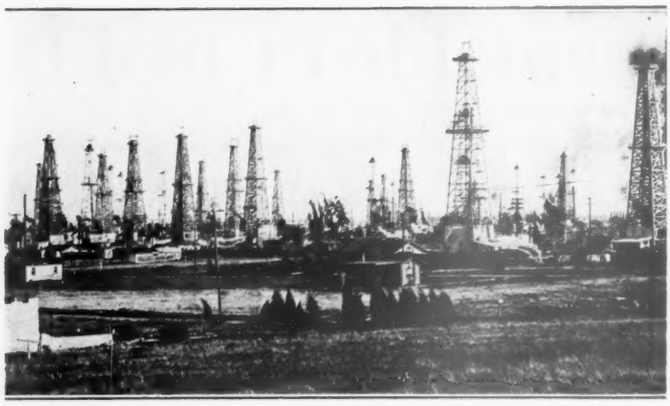
The "Oilwell" 26" Rotary

FOR AN "OILWELL" ROTARY

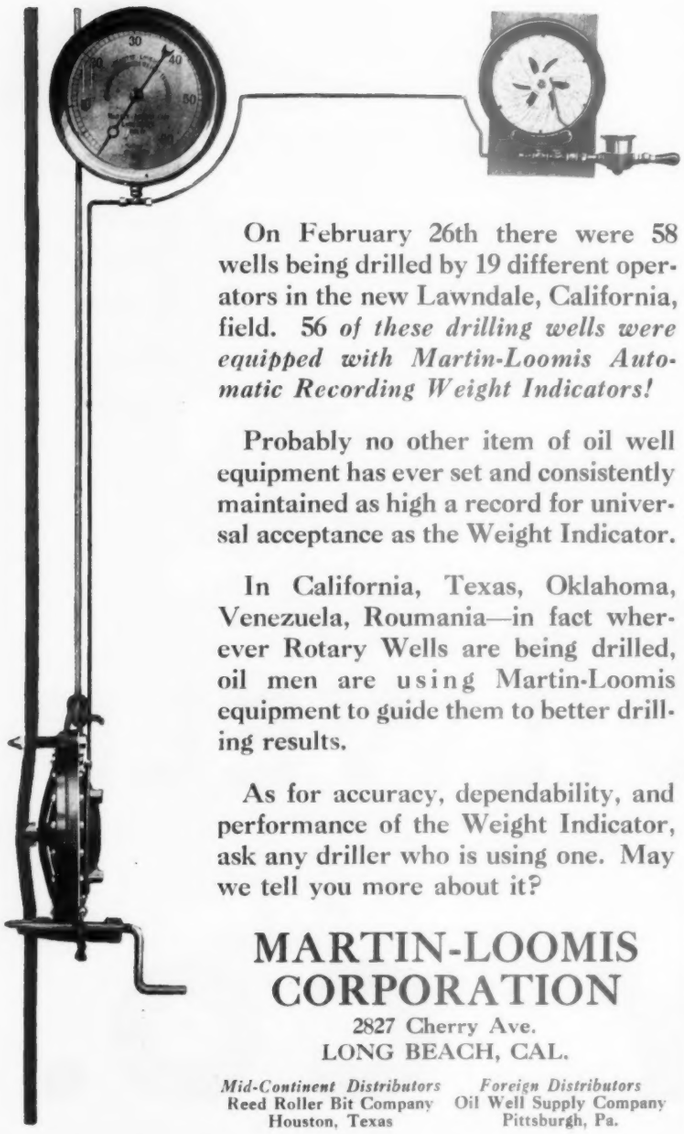
UPPLY CO.

BURGH, U.S.A.

BRANCH STORES
IN ALL OIL FIELDS



This Picture of the New Lawndale "California" Field Was Taken Feb. 26th, 1929



On February 26th there were 58 wells being drilled by 19 different operators in the new Lawndale, California, field. 56 *of these drilling wells were equipped with Martin-Loomis Automatic Recording Weight Indicators!*

Probably no other item of oil well equipment has ever set and consistently maintained as high a record for universal acceptance as the Weight Indicator.

In California, Texas, Oklahoma, Venezuela, Roumania—in fact wherever Rotary Wells are being drilled, oil men are using Martin-Loomis equipment to guide them to better drilling results.

As for accuracy, dependability, and performance of the Weight Indicator, ask any driller who is using one. May we tell you more about it?

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Mid-Continent Distributors
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WEIGHT RECORDING, MEASUREMENT AND CONTROL

RECLAIMING LEASE WHICH MADE MILLIONS

(Continued from Page 37)

furnishes all the pure water necessary without cost.

This well is a curiosity on the lease. It formerly was an oil well drilled in 1916 to 1,100 feet. After being abandoned for oil, some break occurred in the casing about the 650-foot level and a stream of water burst forth which has been flowing continuously since. The well will shoot a 6-inch column of water 30 feet into the air. The water maintains a temperature of 90 degrees the year around. This is used in the boilers and for other purposes.

Economical Operation

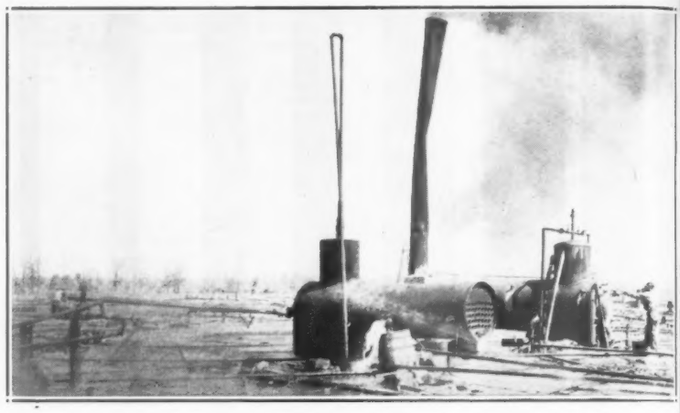
The gas with the water, which formerly was allowed to go to waste, is trapped by use of the old boiler previously mentioned. The boiler is set up near the well and the water with the gas is flowed into the shell of the boiler. The water flows continuously through it, maintaining a constant level, and the gas, rising to the top, collects in the dome from which a pipe directs it to the gas engine in the power plant.

Before the boiler was rigged up, everything was allowed to go to waste. Mr. Horn told Mr. Horn his plan was not feasible and that there was not sufficient gas for any practical use. As the engine requires approximately 40,000 feet of gas daily, Mr. Horn estimates that the well has wasted at least that amount daily for many years.

With holes not over 800 to 1,100 feet deep, permitting use of light derricks and light rigs and short crews, and by use of second-hand drill pipe and casing and free water, Mr. Horn figures on a cost of not over $1,000 a well. Although the free gas is not used in firing the steam boiler running the rig, fuel oil has been cheap.

Each well completed usually pumps initially between 10 and 20 bbls. of net oil daily. The oil, which in reality is a mere scum on the salt water, is separated from the water in a settling pit, into which the fluid from all the wells is pumped. The oil is valuable, being strictly Grade A and containing approximately 85 to 95 per cent lubricating content. The gravity runs around 19 degrees.

The pits consist of two earthen reservoirs, into the first of which the fluid is collected. From here the oil, which holds some b.s. which does not settle out in the first pit, is drained into the second pit, in the bottom of which has been improvised a steam coil. This coil maintains sufficient temperature to break the b.s. and water which settles. The oil on top meets the full pipe line requirements and at present is being run by the Sun Pipe Line Co.



Artesian well (left) on Horn lease and improvised separator for gas.

Although there are about six shallow sands, the main shallow sand being drilled to is about 120 feet thick, generally from 960 to 1,180 feet. To get as much oil as possible without the water, only about 8 feet of screen is set in this. The casing is set in gumbo and shale formation above, which makes an especially good seat without cementing. Mr. Horn has a policy of never lifting casing after dropping it on the seat as some operators do in trying to drive the casing lower.

Mr. Horn is being aided in his operations by Jack Martin, his driller, who has been taken in for a quarter interest in the property. Mr. Martin, one might say, is a part of the lease, and feels as much kindly interest in it as Mr. Horn, as he has been drilling on it since the discovery well was brought in by the Starlight Oil Co. Mr. Martin started work for Mr. Esperson when the latter obtained the leases and was in charge of all his operations.

Water filled crater which marks spot of one of worst blow-outs in Humble Field.

While working over this shallow sand Mr. Horn keeps the idea in the back of his head that some day he will make a deep test. As previously mentioned, no deep tests have been drilled on the property, except one. That test, in the extreme northeast corner of the lease, went to 1,800 feet, where cap rock was hit. The dip in this test from other tests on the extreme east edge of the property and

demands Bettis

The only all-rubber Protectors. They snap on and they "stay put". No seams. No hinges. No metal added to hole. They outlast the pipe. Many Bettis-equipped strings have been in service for more than a year. Fully patented.

Application of the Protector by means of a special Expander is but a matter of seconds. Any crew can install the Protectors. No experience necessary.

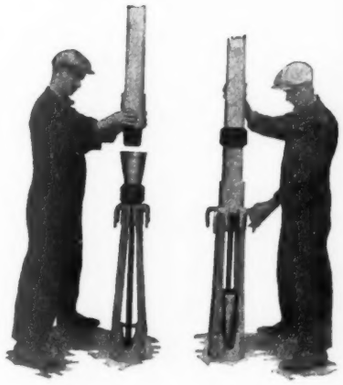
"Best bet yet!"

Ask for Catalog.

Bettis Protectors are carried in stock in Los Angeles, Long Beach, Santa Fe Springs, Ventura, Bakersfield, Coalinga, Tulsa, Houston, Wink and New York City.

Hopkins Anti-Friction Tool Joints and Collars—now available with genuine Bettis Protectors.

These tool joints are made under licenses granted to leading tool manufacturers by us.



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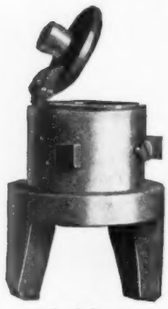
MILLER COMBINATION BAILER & SAND PUMP—*Speed With Certainty*

Star Bottom
used for cutting the sand loose and preferred by some to the Chisel Bottom.

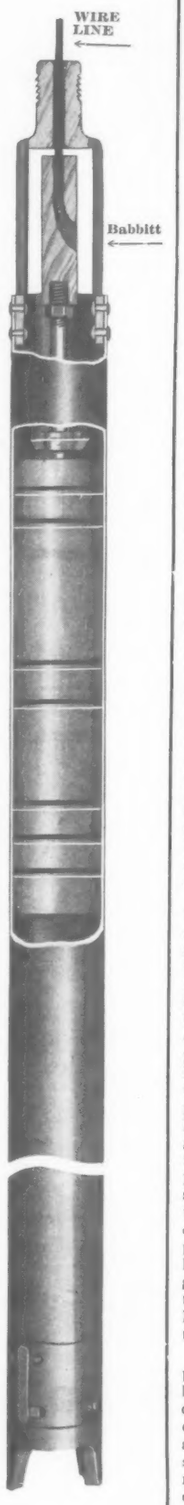
Chisel Bottom
will save the expense of running tools and its chisel shape prevents sticking in tightly packed sands.

Bailer Bottom
will speed up production in cavy holes by time saved in picking up cuttings.



Sand Pump
Bottom illustrated in position in the pump.

Miller
Sand Pump



IN the Miller Combination Bailer and Sand Pump, as illustrated, the wire line has direct connection with Plunger, eliminating a rod, enabling use of a longer pump in the well. The Plunger is made 18 inches long with eight water courses, permitting the fluid to seal the valve on top of the Plunger, thus creating a greater suction than in any other pump made.

Its unequalled performance is due to combining the best features of both a sand pump and bailer, giving greatest efficiency with utmost economy.

Constructed of National Seamless Tubing and Sivyer Steel Castings, the Miller is built throughout of steel and eliminates the use of leather washers. Made in 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9-inch sizes with any length up to 30 ft.

Send for circulars and price list. The Miller Combination Bailer and Sand Pump is sold through the leading supply stores or direct from the factory.

Patented
March 1, 1921, No. 1370340
January 20, 1925, No. 1523604

MILLER
Combination Bailer & Pump Co.
SAPULPA, OKLAHOMA

on other leases to the east in which the cap was found between 1,200 and 1,300 feet and the salt from 1,300 to 1,500 feet would offer a possibility for lower sands to overlie the dome on this flank, and as a test to the west of Mr. Horn's property drilled several years ago to below 2,300 feet without finding the cap, being abandoned in blue shale, Mr. Horn does not feel that his property has been condemned for deeper production.

PRODUCTION OF STEEL HAS AGAIN INCREASED

By B. E. V. Luty

PITTSBURGH, Pa., Mar. 25. — The total production of steel has increased since the first of the month, and pressure upon mills for deliveries seems to be even heavier now than then. Total production of welded and seamless combined is about 60 per cent of capacity. Nearly all merchant bar, sheet and strip mills are operating at their fullest capacity and have orders piled up ahead for several weeks of production. The percentage of pipe and tube production is low more on account of increases in capacity in the last few years than on account of demand having decreased. Demand on the whole has been fair. Production in the year to date has run ahead of that a year ago, but just what last year's production was will not be known until official statistics of all steel production are issued, within the next couple months.

Addition of tubular goods capacity has been in two spells, the first appearing in the retrospect not to have been warranted while the second is in line with the swing in demand. In 1923 there was very heavy demand for welded tubular goods and the mills ran substantially at capacity almost through the year, being for much of the year behindhand in their deliveries. There was very heavy demand for oil country goods, and of course it looked as if the demand would keep up. In the next two or three years many additional welding furnaces were built, but even in 1926 when there was very active drilling the capacity was by no means fully engaged. The second lot of new construction has been in seamless.

In a review of the pipe trade in 1926 for The Oil and Gas Journal the writer estimated the increase in welded tubular goods capacity at from 3,700,000 gross tons in 1923 to 4,450,000 gross tons in 1926 and since then the Bethlehem Steel Co. has built a plant at Baltimore whereby the total capacity may be set at say 4,600,000 gross tons a year. Seamless capacity has increased rather sharply of late and is well in excess of 1,000,000 tons. Thus the total tubular goods capacity at regular pipe mills and at seamless tube mills is not far from 6,000,000 gross tons a year, and this count does not include the electrically welded line pipe of the A. O. Smith Corp., by a special process. The actual production at the present time is in the neighborhood of 1,000 tons a day. Thus the total capacity exceeds 6,000,000 tons a year. The heaviest actual production was 4,177,844 gross tons, in 1926, comprising 3,402,515 tons of welded and 775,329 tons of seamless. The A. O. Smith Corp. was not then producing.

By the middle of March the seasonal peak rate in total steel production had been reached, with substantially all the open-hearth capacity running full and under pressure. While there may now be a slight recession, indications are that substantially the peak rate recently reached will be continued until about the end of April. This rate is nearly 10 per cent above the highest rate reached last year.

It is impossible to make a satisfactory analysis of where all the steel is going for some of the large consuming lines are not doing any better than at various times in the past. Only the automobile and agricultural implement industries are running exceptionally well.

It looks as if price advances announced in the past few weeks in bars, shapes, plates, sheets and strips will not be insisted upon for second quarter. Pig iron at Birmingham has broken $1 a ton, to $15.50, on account of light consumption by cast iron pipe works.

EASTERN FIELDS

(Continued from Page 64)

The Twenty-five Association, Inc., is drilling on the William Carnahan farm.

In the SE of Section 2, Cross Creek Township, Jefferson County, Featner & Co. have completed No. 4 on the John Featner farm. It produced 20 bbls. the first 24 hours after shot in the Berea grit.

In Section 26, Warren Township, Belmont County, the Preston Oil Co. has a very light pumper in the Berea grit at No. 3 on the Colpitts-Boswell farm.

In Section 16, Perry Township, Licking County, the Preston Oil Co. has completed in the Berea grit No. 14 on the James C. Wright farm. It is an 8-bbl. pumper. In Section 1, same township, Farmer & Rugg's No. 4 on the Edward Wright's 50 acres is a 10-bbl. pumper in the same formation.

In the SW of Section 13, Harrison Township, Perry County, the Ohio Fuel Gas Co. has a light gasser in the Clinton sand on the Levi Watts farm. In Hardy Township, Holmes County, the same company has a duster in the same formation on the H. H. Nethrow farm. In Monroe Township, the Arkansas Fuel Oil Co.'s second test on the John F. Patterson farm is a gasser in the Clinton sand. The same company has a rig up on the William Miller farm.

In Paint Township, Holmes County, the Ohio Gas Co. is drilling on the John J. Harshbarger farm. In Hardy Township the same company has a rig up on the Thomas Harris farm. In Clark Township, Coshocton County, the Logan Gas Co. is drilling on the Victor Schebie farm. In Monroe Township, the Ohio Oil Co. is drilling on the Ellsworth Markley farm. In Paint Township, Holmes County, the Logan Gas Co. has a rig on the Henry Fritz farm. In Center Township, Noble County, Richard L. Moore and others have started to drill on the Lemuel Moore farm. In Jefferson Township, H. C. Morris has a duster on his own farm. In the same township, Joseph Saling and others have a light pumper at a second test on the Alice Feldner farm.

Some test work is starting in Meigs County, in Section 25, Salisbury Township, J. G. Cochran and others have started to drill on the Roy Lansbury farm. In Section 23, same township, W. N. Shipe & Co. have started to drill on the Dolly Diehl farm. In Section 24, Bedford Township, the Ohio Fuel Supply Co. has started to drill on the C. M. Brickels farm.

SOUTHWEST PENNSYLVANIA

On Pettit Run, Washington Township, Greene County, the Manufacturers Light & Heat Co. completed No. 12 on the J. W. Closser farm. It is a gasser in the Gordon sand good for 3,000,000 feet. In Richhill Township the same company has completed a test on the L. D. Lightner farm, dry in all sands.

KINGWOOD'S ANNUAL MEETING

Joseph T. King was re-elected president of the Kingwood Oil Co. at the annual meeting of the stockholders. C. M. Berquist, first vice president; M. F. Graham, second vice president, and L. A. Schumacher, secretary and treasurer, were also re-elected, and the officers named, together with J. C. Denton of Tulsa, make up the board of directors. The Kingwood Oil Co. produced 451,000 bbls. of crude oil in 1928. It has oil and gas leases in Oklahoma, Texas and New Mexico.

SOUTHLAND ROYALTY DIVIDEND

At the regular quarterly meeting of the Southland Royalty Co., in Ponca City, Okla., the regular quarterly dividend of 15 cents per share on the 1,000,000 shares of the company was ordered paid on April 15 to stockholders of record on April 1. E. W. Marland is chairman of the board of directors of the company.

NEW LINE TO DALLAS FROM PETROLIA FIELD

DALLAS, Tex., Mar. 23.—A new natural gas pipe line, from Petrolia to Fort Worth and Dallas, 135 miles, is planned by the Lone Star Gas Co., L. B. Dening, president, announced.

The line will be of 20-inch pipe, with a daily capacity of more than 100,000,000 cubic feet and will cost several million dollars. It will be the largest gas line in this part of the State and will give the company four main lines reaching from Fort Worth and Dallas from the Northwest and North. Two lines, one 10-inch and one 16-inch, now bring gas in from the Northwest, tapping the Texas Panhandle, the Petrolia and Oklahoma fields, and a third comes in on the north from Oklahoma. Two other large mains come in from the south, bringing gas from West Texas.

The new carrier will not only afford additional service for Fort Worth and Dallas, but will benefit many other cities and towns served by the system. It will enable gas from the West Texas fields to be diverted to cities south of Dallas in cold weather, benefiting Waco, Cleburne, Georgetown, Temple, Waxahachie, Corsicana, College Station and others. The line will run near Bowie, Bridgeport, Decatur, Alvord and Sunset.

"The decision to build the new line follows the ever-increasing demand on our system, which reached a peak this winter," said Mr. Dening. "The contemplated addition to our properties, which was decided on after a survey of the territory, indicates the rapid development of this part of the State. The step is taken in anticipation of future demands for gas in Dallas and Fort Worth from industries and domestic consumers."

GAIN IN DEMAND FOR ANTIKNOCK GASOLINES

(Continued from Page 35)

line. These substitutes, in most cases, were worthless and at this time tetraethyl lead is the only chemical available whose value has been definitely established in the manufacture of antiknock gasolines on a commercial basis.

Benzol, a by-product obtained in the manufacture of coke from coal, is a motor fuel with a high antiknock rating. Some companies have mixed benzol with gasoline to secure an antiknock motor fuel. In fact the usual method of rating any gasoline as to its antiknock properties is based on the benzol equivalent. The output of benzol is small and this has limited the quantity of blend available.

Thus, competition in the sale of antiknock gasolines has been narrowed down to Ethyl Gasoline and "pure" gasolines secured from crude oil without the use of chemicals. In some areas there are still a few brands of premium gasoline which are sold without special reference to their antiknock properties. Before the introduction of Ethyl Gasoline motor fuels were sold at premium prices by a few distributors. The superiority of these gasolines was entirely based on gravity and distillation range. The seller usually offered a high gravity product with low initial and endpoint. This gave the motorists a quick starting motor fuel which was particularly attractive in the colder sections during the winter months.

Marketing Viewpoint

These high gravity gasolines during the past three years have been overshadowed in importance by antiknock gasolines. Many distributors, in their premium grades of antiknock gasolines, insist on a product with low initial and endpoint in order to give the car owner quick starting and acceleration as well as freedom from knock. The Ethyl Gasoline Corp. in its contracts with licensees specifies a certain distillation range in the base fuel in order to assure the maximum in performance.

The wide distribution of Ethyl Gasoline has caused it to become the yardstick by which all antiknock gasolines are measured. In the method of testing, as previously stated, a benzol equivalent is the standard of measurement. Actually, however, the practice of all refiners is to compare their products with the Ethyl Gasoline sold in their territories. Their aim is to secure a product which approximates the antiknock rating of Ethyl Gasoline.

The same situation is found in the sale of antiknock gasolines. Ethyl Gasoline to a large extent has set the marketing standards which competitive brands either attempt to duplicate or exceed.

Consumption Increases

The consumption of antiknock gasolines is increasing rapidly. According to the Ethyl Gasoline Corp. the sales of Ethyl Gasoline totaled 800,000,000 gallons in the United States or about 7 per cent of the total consumption. No figures are available as to the consumption of other antiknock gasolines sold at premium prices. The records of representative companies indicate that the rate of increase is large.

It is not unusual to find a distributor whose sales of antiknock gasoline run as high as 50 per cent of total sales. One large distributor of Ethyl Gasoline in a southwestern state has gradually increased its sales so that the premium product represents 40 per cent of its combined retail station and jobber sales. It is known that in several sections the increased demand for Ethyl Gasoline represented all of the increase in gallonage obtained by the Standard of Indiana last year.

The Mid-Continent Petroleum Corp., Tulsa, is one of the companies which has obtained a wide distribution for its own brand of antiknock gasoline. This gasoline is sold under the trade name of NevrNox gasoline. The ordinary domestic grade is known as Diamond gasoline.

Following is the percentage of NevrNox sales to Diamond sales in February:

	Per cent
Waterloo, Iowa, division	79.97
Oklahoma division	47.90
St. Louis division	40.58
Average	54.30

Refiners whose plants can give them a product the equivalent of the Ethyl Gasoline usually have no difficulty in disposing of their entire output either through their own stations or to jobbers. In most cases the percentage of this antiknock gasoline available from a refinery is relatively small although the owners are rapidly changing their plant equipment to secure larger yields.

In the Mid-Continent Field, independent refiners have had numerous inquiries from jobbers in the Standard of Indiana territory who are anxious to secure a source of supply for a premium grade of antiknock gasoline.

Some of these jobbers desire Ethyl Gasoline while others prefer some other grade. Experience has shown that these other grades must have high antiknock rating. Simply coloring the gasoline or giving a product with a high gravity and low distillation range does not satisfy the discriminating car owner. In other words, the sales effort must be supported with quality in the gasoline.

Outside of the premium grade of antiknock gasoline sold in competition with Ethyl Gasoline a number of refiners have improved their ordinary grades of domestic gasoline. By segregating their gasolines at the refineries they have been able to sell through their own stations without premium prices a gasoline which is higher than the average in antiknock rating. These gasolines are said to satisfy the usual requirements in regard to knock rating.

In this connection it is known that research work is under way covering the manufacture of antiknock gasolines from crude petroleum which may have wide significance in marketing before the end of the year. One of the largest refinery organizations with a nationwide marketing organization is said to have perfected a cracking operation which will give the company a large output of antiknock gasoline the equal of any of the grades now sold at premium prices. The policy of this company in the past has been to have only one gasoline price to consumers and dealers.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 44)

W. W. Donnelly & Young's No. 1 Middlebuster, C Sec. 11, Blk. 9, D.&S.E. Sur. ..... 7,000,000 ft. gas at 1,663 ft.; shut down 1,690 ft.; small oil show.

Moncrief, Donnelly et al's No. 2 Todd, C Sec. 53, Blk. UV, G.C.&S.F. Sur. ..... Set 10-in. casing 1,355 ft.; drlg. 1,530 ft.; top lime 1,265 ft.

Moncrief, Donnelly et al's No. 3 Todd, C Sec. 55, Blk. UV, G.C.&S.F. Sur. ..... Spudded and shut down.

Tidal Oil Co.'s No. 1 Weathered, 5,055 ft. SW of NE line and 330 ft. SE of NW line Sec. 30, Blk. 31, H.&T.C.R.R. ..... Top salt 485 ft.; set 10-in. casing 820 ft.; drlg. 1,609 ft.

J. D. Wheeler's No. 1 State Land, 744 ft. S and 1,250 ft. E from SE cor. Sec. 73, Blk. 1, I.&G.N.R.R. Sur., but in Vacancy Strip ..... Top salt 492 ft.; set 8-in. casing 595 ft.; drlg. 760 ft.

CULBERSON COUNTY

Deep Rock Oil Co. et als' No. 1 Kloh-Rumsey, 800 ft. S and 1,422 ft. E of NW cor. Sec. 33, Blk. 59, Twp. 7, T.&P.R.R. Sur. ..... Running 10-in. casing 300 ft.; drlg. 900 ft.

Hickey & Stiver's No. 1 C. O. Finley, 660 ft. N and 1,980 ft. W Sec. 20, Blk. 82 ..... Hole full water; small oil show 1,331 ft.; pipe set 1,418 ft.; shut down 1,820 ft. for drilling lime.

W. S. Hillyer's No. 1 McGregor, C NW Sec. 14, Blk. 81.. Shut down 720 ft. for water.

Scott & Dittman's No. 1 Miller, 1,160 ft. N and 2,480 ft. E Sec. 1, Blk. 97, Public School Land ..... Rainbow 1,056 ft.; 300 ft. sulphur water 1,725 ft.; shut down 1,800 ft. for funds.

FISHER COUNTY

Bickerstaff et al's No. 1 McWhirter, 2,640 ft. E and 150 ft. N of SW cor. of Sec. 295, Blk. 2, H.&T.C. Sur. .... Shut down 2,000 ft. for orders.

Cranfill & Reynolds' No. 2 Willingham, 1,980 ft. S and 2,310 ft. W of NE cor. Sec. 207, B.B.B.&C.R.R. Sur. .. Drlg. 2,845 ft.

Cranfill & Reynolds' No. 1 Fleming, 1,980 ft. S and 2,310 ft. E of NW cor. Sec. 207, B.B.B.&C.R.R. .... Oil show 2,905 ft.; set 6-in. 3,160 ft.; drlg. 3,280 ft.

Dunnegan Bros.' No. 1 T. Henry, 330 ft. N and E of SE cor. Sec. 21, George W. Burdett Sur. No. 322, but in Sec. 4, Robert Hibbett Sur. No. 331 ..... Drlg. 2,685 ft.

Gillman-McMurray & French's No. 1 Cleveland, 781 ft. N and 1,336 ft. W of SE cor. Sec. 116, Blk. 2, H.&T.C. Sur. ..... Set 8-in. casing 685 ft.; drlg. 2,195 ft.

Landreth Prod. Corp.'s No. 1 Cooper, 440 ft. SE of NE cor. NW Sec. 115, Blk. 1, H.&T.C. Sur. ..... Show oil 2,760-70 ft.; underreaming 3,185 ft.

Mesa Oil Co.'s No. 1 Griffin, 849 ft. N and 465 ft. E of NE cor. Sec. 20, School Land ..... Drlg. 1,290 ft.

Roeser & Pendleton's No. 1 Haugh, 440 ft. S and 1,320 ft. E of NW cor. of SW of Sec. 191, B.B.B.&C.R.R. Sur. ..... Drlg. 1,180 ft.

Texas-Phillips' No. 1 Hall, 330 ft. N and W of SE cor. Sec. 6, Blk. 20 ..... Drlg. 1,400 ft.

White Eagle Oil & Ref. Co.'s No. 1 Hughes, 4,942 ft. S and 560 ft. W of NE cor. Cosby Sur. 220 ..... Drlg. 20 ft.

GAINES COUNTY

Pure Oil Co.'s No. 1 A. A. Williamson, 1,650 ft. S and 330 ft. W of NE cor. Sec. 110, Blk. H, D.&W.R.R. .. Top salt 2,339 ft.; shut down 3,992 ft.

GARZA COUNTY

Emerald Oil Co.'s No. 4 J. M. Boren, 330 ft. S and W NE cor. Sec. 136, Blk. 5, H.&G.N. Sur. ..... Set 8-in. casing 1,975 ft.; pay 2,530-35 ft.; 100 qts. 2,507-33 ft.; 1,600 ft. oil; cleaning out; total depth 2,573 ft.

GLASSCOCK COUNTY

Chas. Daniel et al's No. 1 Meek, 2,310 ft. W and 1,600 ft. N of SE cor. Sec. 7, Blk. 34, Twp. 3s, T.&P. Sur... Shut down 500 ft.

Gibson & Johnson's No. 1 Mann, C NW Sec. 6, Blk. 33, T.&P. Sur. ..... Hole full salt water 3,415 ft.; shut down 3,448 ft.

R. R. Penn's No. 1 Hughes-Johnson, C NW Sec. 45, Blk. 30, W.&N.W. Sur. ..... Underreaming 2,775 ft.

Marland Prod. Co. et al's No. 7-A Settles, 2,310 ft. S and W of NE cor. Sec. 158, Blk. 29, W.&N.W. Sur. .. Location.

Meriweather Oil Co.'s No. 2 McDowell, 1,492 ft. N and 150 ft. E of SE Sec. 35, Blk. 34, Twp. 2s, T.&P. Sur... Hole full water 2,665 ft.; set 6-in. casing 2,700 ft.; drlg. 3,030 ft.

World Oil Co.'s No. 1-C McDowell, 1,650 ft. S and 2,310 ft. W of NE cor. Sec. 21, Blk. 34 ..... Drlg. 1,630 ft.

White Eagle Oil & Ref. Co.'s No. 1 Dunbar, C of NW Sec. 46, Blk. 34, Twp. 4s, T.&P.R.R. Sur. ..... Drlg. 3,650 ft.

HOWARD COUNTY

Amerada Pet. Co. & Rycade Oil Corp.'s No. 7 Dora Roberts, 330 ft. S and 2,310 ft. W of NE cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 2,585 ft.

Amerada Pet. Corp.'s No. 8 Roberts, 1,116 ft. N and 1,022 ft. W of SE Sec. 128, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 950 ft.

American Maracaibo Co.'s No. 1 Settles-D, 330 ft. S and 1,650 ft. E of NW cor. Sec. 158, Blk. 29, W.&N.W. R.R. Sur. ..... Drlg. 2,100 ft.

American Maracaibo Co.'s No. 4 Settles-C, 1,373 ft. S and 3,023 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s .. Drlg. 2,090 ft.

American Maracaibo Co.'s No. 5 Settles-C, 330 ft. S and W of NE cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. ..... Drlg. 1,754 ft.

Bristow & Merrick's No. 10 Hooks, 660 ft. S and 2,440 ft. E of NW cor. Sec. 140, Blk. 29, W.&N.W.R.R. Sur.. Shut down 1,947 ft.

California Co.'s No. 5 Roberts, Lease 2, 1,170 ft. S and 150 ft. W of NE cor. Sec. 156, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 1,220 ft.

California Co.'s No. 1 Settles, 2,310 ft. N and W of SE Sec. 158, Blk. 28, W.&N.W. Sur. ..... Shut down 3,056 ft.

Comet Oil Co.'s No. 3 Clay, 200 ft. S and E NW cor. Sec. 154, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 380 ft.

Cosden & Co.'s No. 3 Roberts, Lease C, 1,520 ft. N and 600 ft. W of SE cor. Sec. 128, Blk. 29, W.&N.W. R.R. Sur. ..... Drlg. 1,256 ft.

Coyle & Concord Oil Co.'s No. 6 D. Roberts, 1,650 ft. S and 150 ft. W of NE cor. Sec. 156, Blk. 29, W.&N.W. R.R. Sur. ..... Shut down 1,899 ft.

Cranfill & Reynolds' No. 1 Kloh-Rumsey, 352 ft. N and 150 ft. W of SE cor. Sec. 3, Blk. 32, Twp. 2s, T.&P.R.R. Sur. ..... Drlg. 1,885 ft.

Empire Gas & Fuel Co.'s No. 3 Clay, 1,315 ft. N and 1,570 ft. W of SE cor. Sec. 127, Blk. 29, W.&N.W. R.R. Sur. ..... Drlg. 100 ft.

F. H. E. Oil Co.'s No. 11-B Dora Roberts, 1,700 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ..... Rigging up standard tools 2,328 ft.

F. H. E. Oil Co.'s No. 5-D Dora Roberts, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 136, Blk. 29 ..... Set 6-in. casing 2,930 ft.; shut down.

Gibson & Johnson's No. 1 Read, 660 ft. N and W of SE cor. Sec. 47, Blk. 30, Twp. 1n, T.&P.R.R. Sur. ..... Location.

Green et al's No. 1 Slaughter, C SW Sec. 32, Blk. 31, Twp. 3n, T.&P.R.R. Sur. ..... Rig.

Group No. 1 & Marland Prod. Co.'s No. 9 Settles, 330 ft. S and E of NW cor. Sec. 133, Blk. 29, W.&N.W. R.R. Sur. ..... Drlg. 2,070 ft.

L. C. Harrison et al's No. 1 G. M. Podge Est., SE cor. Sec. 9, Blk. 30, Twp. 1s, T.&P. Sur. ..... Hole full salt water 1,475-1,505 ft.; top lime 1,825 ft.; show oil 2,972-74 ft.; hole full fluid 3,257 ft.; total depth 3,257 ft.; plugged back to 3,000 ft. to shoot.

Hyer & Yates' No. 4 Clay, 990 ft. S and 1,650 ft. W of NE cor. Sec. 155, Blk. 29 ..... Set 6-in. casing 1,557 ft.; shut down.

Humble Oil & Ref. Co.'s No. 1 H. R. Clay, 990 ft. S and 330 ft. E of NW cor. Sec. 138, Blk. 29, W.&N.W. Sur. ..... Drlg. 2,884 ft.

Magnolia Pet. Co.'s No. 13 Dora Roberts, 2,440 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ..... Rigging up standard tools 2,927 ft.; shut down.

Magnolia Pet. Co.'s No. 18 D. Roberts, 405 ft. N and 330 ft. E of SW cor. Sec. 135, Blk. 29, W.&N.W. R.R. ..... Drlg. 1,855 ft.

Marland Prod. Co.'s No. 3 Clay-F, 250 ft. S and 660 ft. W of NE cor. Sec. 138, Blk. 29, W.&N.W.R.R. Sur. ... Shut down 2,675 ft.

Marland Prod. Co.'s No. 4 Chalk-C, 990 ft. W, 330 ft. S of NE cor. Sec. 140, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 1,715 ft.

Midwest Exploration Co.'s No. 3 Clay-C, 330 ft. N and 990 ft. W of SE cor. Sec. 138, Blk. 29, W.&N.W.R.R. Sur. ..... Shut down 1,062 ft.

Midwest Exploration Co.'s No. 4 Clay-C, 330 ft. N and W of SE cor. Sec. 138, Blk. 29, W.&N.W.R.R. Sur. ... Location.

Moody Oil Co.'s No. 15 Roberts-B, 2,310 ft. S and 330 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ..... Fishing 2,565 ft.

Moody Oil Corp.'s No. 13 D. Roberts, 2,310 ft. S and 2,260 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur.. Location.

Moody Oil Corp.'s No. 10 Roberts-E, 2,310 ft. S and 280 ft. W of NE cor. Sec. 136, Blk. 29, W.&N.W.R.R. Sur. ..... Drlg. 2,550 ft.

Merrick & Bristow's No. 8 Dora Roberts, 990 ft. N and 330 ft. E of SW cor. Sec. 137, Blk. 29, W.&N.W. Sur.. Cem. 8¼-in. 1,929 ft.; drlg. 2,750 ft.

Plymouth Oil Co.'s No. 2 Kloh et al, 990 ft. S and 1,650 ft. W of NW cor. Sec. 5, Blk. 32, Twp. 2s, T.&P. R.R. Sur. ..... Drlg. 120 ft.

Plymouth Oil Co.'s No. 3 Kloh et al, 1,650 ft. S and 990 ft. E of NW cor. Sec. 5, Blk. 32, Twp. 2s, T.&P. R.R. Sur. ..... Rig.

Schermerhorn Oil Co.'s No. 5 Roberts-A, 1,650 ft. S and 2,250 ft. W of NE cor. of Sec. 137, Blk. 29, W.&N.W. Sur. ..... Drlg. 2,612 ft.

Schermerhorn Oil Co.'s No. 6 D. Roberts-A, 1,650 ft. S and 330 ft. W of NE cor. Sec. 137, Blk. 29, W.& N.W.R.R. Sur. ..... Location.

Superior Oil Co.'s No. 14 Dora Roberts-B, 2,310 ft. E and 380 ft. S of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ..... Rigging up.

Superior Oil Co.'s No. 15 Dora Roberts-B, 2,310 ft. S and 380 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. R.R. Sur. ..... Fishing 2,565 ft.

Ward Oil Co.'s No. 7 Roberts, 2,310 ft. N and 380 ft. E of SW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ..... Location.

Witherspoon et al's No. 2 Kloh-Rumsey, 280 ft. N and 3,315 ft. E of SW cor. Sec. 3, Blk. 32, Twp. 2s, T.&P.R.R. Sur. ..... Drlg. 2,004 ft.

HUDSPETH COUNTY

American Land Co.'s No. 1 Lockhart & Roseborough, C SE Sec. 5, School Blk. 21 ..... Total depth 260 ft.; shut down; tools moved off.

California Co.'s No. 1 University, 3,821 ft. N and 2,554 ft. E of SW cor. Sec. 19, Blk. E ..... Set 16-in. casing 591 ft.; total depth 624 ft.; shooting crooked hole.

Western States Oil Co.'s No. 1 Moore, C SE Sec. 16, Blk. 71, Twp. 6, T. &P. Sur. ..... Straightreaming 2,700 ft.; total depth 2,865 ft.; fishing job.

Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 ..... Hole full water 2,945 ft.; underreaming 8¼-in. casing at 2,840 ft.; trying to get water shut off; shut down 3,140 ft.; trying to pull casing.

IRION COUNTY

Fuhrman Pet. Co.'s No. 1 J. O. Suggs, Lease 1, C SE Sec. 3,024, Blk. 24, H.&T.C. Sur. ..... Location.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 2, C SW Sec. 3,009, Blk. 24, H.&T.C. Sur. ..... Moving in material.

Kimbrough & Flinchbaugh's No. 1 Tankersley, 160 ft. S and 200 ft. W of NE cor. Sec. 712, Ford Willig Sur.. Drlg. 510 ft.

Kimbrough & Tuel's No. 1 J. M. Nutt, 1,920 ft. S. 200 ft. E of NW cor. Sec. 5, Gonzales Co. School Land... Set 6-in. casing 1,360 ft.; show oil and gas; shut down 1,400 ft.

Pecos Valley Oil Co.'s No. 1 Stocks, 2,500 ft. N and 1,250 ft. W of SE cor. Sam Wallstein Sur. No. 746... Shut down 1,285 ft.

Signal Oil Co.'s No. 2 Suggs, 5,240 ft. from N line and 996 ft. from W line, Sec. 23, Blk. 27, H.&T.C. Sur. .. Top salt 760 ft.; set 15-in. casing 1,360 ft.; set 8-in. casing 2,150 ft.

Sun Oil Co.'s No. 1 Tankersley, 2,128 ft. N and 1,173 ft. E of SW cor. Sec. 8, G.C.&S.F. Sur. ..... Shut down 1,452 ft.

F. E. Webb et al's No. 1 J. M. Nutt ..... Shut down 3,240 ft.

Wesley West et al's No. 1 J. D. Suggs, SE NW SE Sec. 19, Blk. 7, H.&T.C. Sur. ..... Top pay 3,368 ft.; swabbed 35 bbls. oil and 40 bbls. water; 35.8 gravity oil; show oil 5,480-83 ft.; show oil 5,660-70 ft.; shut down 5,875 ft.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means, 1,622 ft. N line, 600 ft. W line Sec. 345, H.&T.C. Sur. ..... Show gas 3,271 ft.; fresh water 000-05 ft.; U.R. 5 3/16-in. csg.; shut down.

JONES COUNTY

Anna Belle Oil Co.'s No. 1 Bickley, 330 ft. S and E of NW cor. SE NE Sec. 50, Blk. 18, T.&P. Sur. ..... Rig.

E. P. Campbell et al's No. 2-C Herndon, 330 ft. N and E of SW cor. NW, Sec. 6, M.E.P.&P. Sur. ..... Shut down 2,600 ft.

Condor Pet. Co.'s No. 1 McDonald, 340 ft. S and 240 ft. W of NE cor. Lot 59, G. A. Kirkland Sur. A-550 .... Location.

Cosden & Co.'s No. 1 Brown, 200 ft. N and 300 ft. W of SE cor. J. H. Grayson Sur. ..... Shut down 2,580 ft.

Cosden & Herbert Oil Co.'s No. 1 Bickley, 320 ft. N and 319 ft. E of SW cor. S half NW Sec. 50, Blk. 18, T.&P. Sur. ..... Rig.

Cosden-Herbert et al's No. 3 Bickley, 330 ft. N and W of SE cor. of S half NW Sec. 50, Blk. 18 ..... Rig.

Cosden & Herbert Oil Co.'s No. 6 Bickley, 330 ft. S and 319 ft. E of NW cor. S half NW of Sec. 50, Blk. 18, T.&P. Sur. ..... Fishing 2,310 ft.

P. K. French's No. 1 Lieson, 150 ft. N and E of SW cor. of E half NW Sec. 31, Blk. 14, T.&P.R.R. Sur. ..... Spudded and shut down.

Grisham & Hunter Corp.'s No. 1 Hester, 330 ft. N and E of SW cor. of E half, Lot 12, Kratz Sur. A-247 .... Drlg. 830 ft.

Grisham & Hunter's No. 1 Tiner, 311 ft. N and 330 ft. W of SE cor. Gabriel Zumwalt Sur. ..... Show oil 2,526 ft.; total depth 2,541 ft.; shot with 60 and 80 qts. 2,515-25 ft.; to pump.

Humble Oil & Ref. Co.'s No. 1 Bickley, 330 ft. N and 200 ft. E of SW cor. of N half of S half of SW Sec. 50, Blk. 18, T.&P.R.R. Sur. ..... Drlg. 300 ft.

Mid-Sun Oil Corp.'s No. 1 George Hoehn, 660 ft. N and W of SE cor. SE 40 ac. of N 160 ac. of W 320 ac. of A Crain Sur. A-162 ..... Drlg. 2,685 ft.

McClanahan et al's No. 1 Hall, 150 ft. N and E of SW cor. of Hall 220-acre tract, C.&M.R.R. Co. Sur. .... 300 ft. oil sand 1,822-30; total depth 1,843 ft.

McGinley Corp.'s No. 1 Whittemore, 660 ft. N and W of SE cor. SE NE Sec. 39, B.B.B.&C. ..... Fishing 1,650 ft.

McMan Oil & Gas Co.'s No. 2 Bickley, 330 ft. N and E of SW cor. of NE Sec. 50, Blk. 18, T.&P.R.R. Sur. ..... Fishing 1,705 ft.

McNeeley et al's No. 1 Roscoe Bland, 1,175 ft. N and 240 ft. W of SE cor. Subdivision 20, A-164, DeWitt Co. School Land. ..... Spudded and shut down.

Roeser-Pendleton & Landreth Prod. Co.'s No. 4 Grayson-A, 315 ft. S and 990 ft. W of NE cor. their lease out of Sec. 13, Blk. 19, T.&P.R.R. Sur. ..... Swabbed 95 bbls. 24 hrs. 2,529-41 ft.

Sedgwick O. & G. Co.'s No. 1 Routh, 1,250 ft. N, 2,500 ft. W SE cor. 299-acre tract, Austin & Williams Sur. 355-A-7 ..... Drlg. 2,270 ft.

Sedgwick Oil & Gas Co.'s No. 1 Brown, 660 ft. N and 1,320 ft. E of SW cor. Sec 9, Blk. 1, T.&N.O. Sur. Location.

The Texas Company's No. 2 Camp, 2,829 ft. N and 323 ft. W of SE cor. Camp 189.5-acre lease Sec. 13, T.&P. Sur., Blk. 19 ..... Rig.

The Texas Company's No. 6 Carter, 200 ft. S and W of NE cor. of L. Carter 173.5-ac. tract out of Sec. 13, Blk. 19, T.&P. ..... Drlg. 940 ft.

U. L. Tomberlin's No. 1 Horn, 1,980 ft. N and 600 ft. E of SW cor. of 502 ac. of Penney Sur. A-283. ..... Spudded and shut down.

W. D. Wells et al's No. 1 Britton, 150 ft. N and 890 ft. E SW cor. 640-ac. tract, H.&W. Sur. 354-355 ..... Moving in material.

White Eagle Oil & Ref. Co.'s No. 1 W. B. Teague, 933 ft. N and W of SE cor. Sec. 30, Austin & Williams Sur. No. 339 ..... Location.

KIMBLE COUNTY

McLean & Jamison's No. 1 Cannon, 1,940 ft. N and 300 ft. W of SE cor. Robert Cockran Sur. ..... Location.

LOVING COUNTY

Lockhart & Co.'s No. 1 R. A. Cox et al, 600 ft. S and 1,980 ft. W of NE cor. Sec. 20, Blk. 26, T.&P. Sur. .. Location.

Lockhart & Co.'s No. 1 Hazell, 2,792 ft. SW of NE line and 660 ft. NW of SE line Sec. 84, Blk. 33, E.&T.C. R.R. Sur. ..... Rigging up standard tools and shut down.

Lockhart & Co.'s No. 1 H. L. Lepp, 330 ft. each way from S cor. of Sec. 3, Blk. 2, W.&N.W. Sur. ..... Top salt 715 ft.; drlg. 2,400 ft.

Lockhart & Co.'s No. 1 Hubbard, 2,640 ft. NE and 660 ft. NW Sec. 84, Blk. 33, H.&T.C.R.R. Sur. ..... Top salt 700 ft.; total depth 2,621 ft.; 31 degree gravity oil, some water; flowing 50 bbls. daily.

Lockhart & Co.'s No. 2 Hubbard, 1,660 ft. from NE line and 330 ft. from SE line of Sec. 83, Blk. 33, H.&T.C.R.R. ..... Rig.

Lockhart & Co.'s No. 1 Johnson, 660 ft. S and 1,980 ft. W of NE cor. Sec. 20, Blk. 56, Twp. 1, T.&P. R.R. Sur ..... Rigging up standard tools.

Lockhart & Co.'s No. 1 Wheat-E, 990 ft. from NE and SE lines Sec. 85, Blk. 33, H.&T.C.R.R. Sur. ..... Drlg. 350 ft.

MIDLAND COUNTY

Phillips Pet. Corp.'s No. 1 Stokes, 440 ft. S and W of NE cor. S. Beall Sur. No. 101, Blk. 37, Twp. 2s, T.P.R.R. Sur. ..... Location.

MITCHELL COUNTY

Magnolia Pet. Co.'s No. 6 Foster, 1,980 ft. N and E of SW cor. Sec. 17, Blk. 29, Twp. 1s, T.&P.R.R. Sur. ... Drlg. 2,285 ft.

Simms Pet. Co.'s No. 1 Elwood, C SE of Sec. 29, Blk. 18, S.P.R.R. Sur. ..... Underreaming 10-in. casing 1,078 ft.

Simms Pet. Co.'s No. 2 Elwood, 1,980 ft. N and 990 ft. W of SE cor. Sec. 29, Blk. 18, S.P.R.R. Sur. ..... Location.

Teas & Wheeler's No. 1 Radford, 1,320 ft. N and W of Sec. 1, Blk. 27, T.&P. Sur. ..... Four bailers salt water per hr. 3,405 ft.; drlg. 4,030 ft.

Westyde Investment Co.'s No. 1 Elwood, C SW Sec. 38, Blk. 16, S.P.R.R. Sur. ..... Location.

NOLAN COUNTY

L. G. Bradstreet et al's No. 1 Kuteman, C NW Sec. 95, Blk. X, T.&P. Sur. ..... Rig.

C. M. Root et al's No. 1 Martin, 330 ft. N and E of SW cor. NW Sec. 30, Blk. 19, T.&P.R.R. Sur. ..... Location.

PECOS COUNTY

Alexander & Lyle's No. 1 Myrtle Sellman, C SW SE Sec. 20, Blk. Z, T.S.Ry. Sur. ..... Top salt 814 ft.; top lime 1,602 ft.; 3,400,000 ft. gas from 1,611-26 ft.; spraying very little oil; sulphur water 1,652 ft.; shut down 1,655 ft.

Atlantic O. P. Co.'s No. 1 Trees, 330 ft. from N and 990 ft. from W line Sec. 108, Blk. 8, H.&G.N.R.R. Sur. ..... Location.

M. H. Black's No. 1 P.V.O. Co., 2,310 ft. from SE and 1,650 ft. from SW lines Sec. 22, Blk. 10, H.&G.N. Sur.. Location.

H. R. Bell et al's No. 1 Gray, 150 ft. from S and 2,490 ft. from W line Sec. 592, G.C.&S.F.R.R. Sur. ..... Location.

Buell & Hagan's No. 1 University-E, 330 ft. N and 2,310 ft. W of SE cor. Sec. 36, Blk. 13, University Land ..... Location.

Cowboy Evans' No. 1 Pecos Valley, 2,310 ft. from NW line, 990 ft. from SW line of Sec. 36, Blk. 3, H.&T.C. R.R. Sur. ..... Location.

Crowley's No. 1 Heiner, 2,400 ft. each way from N and E lines Sec. 589, G.C.&S.F.R.R. Sur. ..... Underreaming 10-in. casing 510 ft.

California Co.'s No. 2 Smith, Lease 5, Sec. 16, 1,550 ft. from W and 200 ft. from N line Blk. 194, G.C.&S.F. R.R. Sur. ..... Rig.

M. C. Dibble & Hale's No. 1 Bonebrake, Sec. 115, Blk. 8, H.&G.W. Sur., elev. 2,555 ft. ..... Top lime 1,305 ft.; set 6-in. casing 1,610 ft.; pulling 8¼-in. casing; total depth 2,004 ft.

Ditto Oil Co.'s No. 1 J. M. Montgomery, Sec. 104, Blk. 331, A-16,387 ..... Shut down 660 ft.

Geyer & Frates' No. 1 Smith, 1,320 ft. each way from N and E lines Sec. 8, Blk. 145, T.&St.L.R.R. Sur. .... Drlg. 400 ft.

Grayburg Oil Co.'s No. 1 University, 990 ft. S and 330 ft. W of NE cor. Sec. 2, Blk. 17, University ..... Drlg. 1,728 ft.

Gulf Prod. Co.'s No. 16 Smith-B, 990 ft. S and 990 ft. E of NW cor. Sec. 22, Blk. 194, G.C.&S.F.R.R. Sur. ..... Drlg. 795 ft.

Imperial Oil & Gas Co.'s No. 1 Pecos Valley Oil Co., 990 ft. from SE line and 1,650 ft. from SW line Sec. 22, Blk. 10, H.&G.N.R.R. Sur. ..... Location.

Marland Prod. Co.'s No. 1 Blakeslee, 330 ft. N of middle of S line Sec. 100, Blk. 8, H.&G.N. ..... Set 6-in. casing 2,092 ft.

Matador Oil Co.'s No. 3 Smith, 2,310 ft. from N and 990 ft. from E lines, Sec. 24, Blk. 194, G.C.&S.F.R.R. Sur. ..... Moving in machine.

Mauch & Kroger's No. 1 Holmes, Sec. 5, Blk. 178, T.C. Sur. ..... Shut down 1,010 ft.

McCarty Oil Co.'s No. 1 A. A. Gray, 1,520 ft. from S and 150 ft. from W lines Sec. 591, Abst. 3,010 ..... T.D. 1,170 ft; top pay 1,152 ft; hole full fluid; pulling casing.

McMan Oil & Gas Co.'s No. 5 Smith-C, 2,600 ft. S and 1,740 ft. from W line of Sec. 25, Blk. 194, G.C.&S.F.. Shut down 1,015 ft.

Mid-Kansas Oil & Gas Co.'s No. 5 Smith, 250 ft. S and 6,821 ft. E of NW cor. of Sec. 31, Blk. 194, G.C.&S.F. R.R. Sur. ..... Drlg. 1,270 ft.

Mid-Kansas Oil & Gas Co.'s No. 26 Yates, 1,312 ft. N from most southerly N line, 1,388 ft. E from most westerly E line Sec. 32, Blk. 194, G.C.&S.F.R.R. Sur.—Location.
Mid-Kansas & Transcontinental's No. 27 Yates-A, 1,296 ft. E and 250 ft. S of NE cor. Sec. 31, Blk. 194, G.C.&S.F. Sur.—Location.
Moncrief et al's No. 1 Tippett, 1,980 ft. from S and 660 ft. from W lines of Sec. 46, Blk. 194, G.C.&S.F. Sur.—Location.
Pecos Valley Oil Co.'s No. 2 fee, 1,620 ft. from SW and 1,320 ft. from NW Sec. 22, Blk. 10, H.&G.N.R.R. Sur.—Top salt 1,107 ft.; total depth 1,632 ft.; flowing 75 bbls.; will deepen.
Perrin et al's No. 1 Eaton, 150 ft. each way from NE and NW lines Sec. 27, Blk. 3, E.&T.C. Sur.—Drlg. 632 ft.
Phillips Pet. Co.'s No. 1 Courtney, 440 ft. S and E of NW cor. Sec. 78, Blk. OW, T.M.R.R. Sur.—Location.
Phillips Pet. Co.'s No. 1 Ramsey, 990 ft. from N and E lines, Sec. 17, Blk. 194, G.C.&S.F. Sur.—Drlg. 1,566 ft.
Stein & McGee's No. 1 Louis Paterson, 150 ft. SE of NW line, 150 ft. NE of SW Sec. 34, Blk. 10, H.&G.N.—Location.
B. J. Spikes' No. 1 George Brown—Shut down 700 ft.
Schumaker et al's No. 1 Williams et al, 330 ft. N of middle of S line Sec. 1, Blk. 117, G.C.&S.F.—Shut down 700 ft.
Southern C. O. P. Co.'s No. 1 Scharbauer Cattle Co., SW cor. Sec. 21, Blk. 134, T.&S.L. Sur.—Show gas 1,455-60 ft.; water 3,175 ft.; drlg. 3,971 ft.
Transcontinental Oil Co.'s No. 1 Sellman, 990 ft. N and W of SE cor. Sec. 7, Blk. 194, G.C.&S.F.R.R. Sur.—Location.
Transcontinental Oil Co.'s No. 1 University, NE NW SW Sec. 18, Blk. 18—Top lime 1,155 ft; straightening crooked hole 4,199 ft.; drlg. 4,239 ft.
Weekley Oil Corp.'s No. 1 Byrne, 990 ft. each way from NW and SW lines of Sec. 24, Blk. 10, H.&G.N.R.R. Sur.—Location.
World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 8, T.P.R.R. Sur., elev. 2,810 ft.—Shut down 3,105 ft.

PRESIDIO COUNTY

L. C. Brite's No. 2 Brite, 2,500 ft. N, 2,200 ft. W of SE cor. Sec. 51, Blk. 12, G.H.&S.R. Sur.—Shut down 250 ft.
Phillips Pet. Co., Empire G. & F. Co., Delmar Oil Co. and C. E. Miller's No. 1 Tootie Est., C NE Sec. 75, Blk. 3, D.&P.R.R. Sur.—Set 8-in. casing 2,365 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 1-C University, 2,598 ft. S and 250 ft. W of NE cor. Sec. 1, Blk. 2, University Land.—Drlg. 705 ft.
The California Co.'s No. 5 University, 2,310 ft. from N and E lines Sec. 16, Blk. 7, University Land—Top salt 1,280 ft.; underreaming 2,918 ft.; shut down 2,960 ft.
Kemrow Co.'s No. 1 Sawyer Cattle Co., 1,320 ft. from N and 1,980 ft. from E line Sec. 8, J. G. Robinson Sur.—Location.
R. V. Oberholtzer's No. 1 Talley, 1,650 ft. each way from S and W lines Sec. 6, G.C.&S.F.R.R. Sur.—Shut down 1,007 ft.
Skelly Oil Co.'s No. 4 University, 2,310 ft. N and 990 ft. W of SE cor. Sec. 33, Blk. 8—Location.
Texon O. & L. Co.'s No. 1-B University Group 1—Top pay 6,250 ft.; hole full of oil; well made two small heads; oil sand 8,482 ft.; total depth 8,525 ft.; flowing 2,190 bbls. daily.

REEVES COUNTY

Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft.—Total depth 2,900 ft.; shut down.
Southern Crude O. P. Co.'s No. 1 Kloh-Rumsey, 2,310 ft. N and W SE cor. Sec. 23, Blk. 51—Drlg. 890 ft.
David R. Thompson's No. 1 A. A. Eddins—Fishing casing 5,658 ft.
Robert Penn et al's No. 1 Bowles, 2,310 ft. SW of NE cor. Sec. 36, Blk. 50, Twp. 8, T.&P.R.R. Sur.—Top salt 1,725 ft.; drlg. 4,650 ft., anhydrite.
Lee O. White et al's No. 1 Kloh-Rumsey, 660 ft. S and E of NW cor. Sec. 5, Blk. 51, Twp. 10, T.&P. Sur.—Straightening crooked hole 350 ft.

RUNNELS COUNTY

Boyce et al's No. 1 E. O. Lange, 2,300 ft. S and 6,900 ft. W of NE cor. Austin & Williams Sur. No. 262—Shut down 1,350 ft.
Foster et al's No. 1 Currie, 1,866 ft. SE of NW line, 335 ft. SW of NE line Gray Carroll Sur.—Shut down 360 ft.
J. D. Hamilton et al's No. 1 A. Spill, 1,320 ft. S and W of NE cor. A. Spill 891 acres, out of Thomas R. Webb Sur. 358—Shut down 100 ft.
Independent Oil & Gas Co.'s No. 1 Will Rollwitz, 330 ft. S and W of NE cor. S half M. Salinas Sur. No. 20½.—Drlg. 1,280 ft.
Marland Prod. Co.'s No. 1 August Herring, 330 ft. S and 1,650 ft. W of NE cor. Sec. 39, E.T.R.R. Co. Sur.—Drlg. 2,120 ft.
McLean et al's No. 1 G. W. Clayton, 150 ft. N line, 270 ft. from W line Sec. 135, E.T.R.R.—Shut down 1,185 ft.
Course & Tilton's No. 1 R. A. Stokes, 200 ft. S, 600 ft. E of NW cor. G.C.&S.F. Sur. No. 2—Shut down 3,000 ft.
J. B. Summers et al's No. 1 J. W. Reese, M. J. Parramore Sur. 26—Shut down 1,650 ft.
Union Oil Co. of Nevada's No. 1 W. E. Allen, 1,000 ft. N and W of SE cor. Sec. 1, H.E.&W.T. Sur.—Shut down 3,704 ft.; oil show 3,423 ft.
Vacuum Oil Co.'s No. 4 McMillan, 555 ft. S and 717 ft. W of NE cor. Lot 22, Domingo Diaz Sur. No. 532—Location.

SCHLEICHER COUNTY

W. F. Long and O. C. Long's No. 1 W. H. Williams, NE cor. Sec. 28, H.E.&W.T.R.R. Sur—Shut down 275 ft.

SCURRY COUNTY

J. B. Mims et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur.—Spudded and shut down.
J. E. Dieckman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur.—Drlg. 2,575 ft.

STERLING COUNTY

J. & G. Oil Co.'s No. 1 W. L. Foster, C SE Sec. 20, Blk. 12, S.P.R.R. Sur.—Show oil 1,296-98 ft. and 1,356-58 ft.; underreaming 2,175 ft.
George L. Miller's No. 1 Foster, 3,690 ft. S and 1,397 ft. W of NE cor. Sec. 4, Blk. 31, T.&P. Sur.—Set 12½-in. casing 830 ft.; drlg. 1,925 ft.

SUTTON COUNTY

Phillips Pet. Co.'s No. 1 A. G. Holman, 2,310 ft. S and 330 ft. W NE cor. Sec. 25, G.C.S.D.&N.G.R.R. Sur.—Total depth 6,096 ft.
A. G. Priest's No. 1 Allison, 1,320 ft. N and E of SW cor. Sec. 52, Blk. A, T.&P. Sur.—Set 15-in. casing 530 ft. and shut down.
Southern C. O. P. Co.'s No. 1 Allison, 2,310 ft. S and 320 ft. W of NE Sec. 41, Blk. K, G.H.&S.A. Sur.—Underreaming 3,507 ft.

TAYLOR COUNTY

Basham-Hunter Corp.'s No. 1 Campbell, 330 ft. S and E of NW cor. SW Sec. 65, Blk. 19, T.&P. Sur.—Shut down 2,780 ft.; hole full water 2,769-80 ft.
J. B. Jameson's No. 1 Webb, 1,170 ft. S and W of NE cor. Sec. 46, Lunatic Asylum Land—Rig.
Mid-Continent Oil & Gas Co.'s No. 1 Taylor, 990 ft. W 215 ft. N SE cor. 100-ac. tract, Sec. 18, Guadalupe School Land Sur.—300 ft. oil 2,384-87 ft; 2,445-50 ft; swabbed 5 bbls.; run 5-in. casing 2,900 ft.
Pet Drlg. Co.'s No. 1 Martin, 990 ft. E and 1,650 ft. N of SW cor. Sec. 30, Blk. 19, T.&P.R.R. Sur.—Location.
Pontz Oil Corp.'s No. 1 Armour, 375 ft. N and 320 ft. W of SE cor. W half Sec. 16, Blk. 6, S.P.R.R. Sur.—Drlg. 2,200 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T.R.R. Sur.—Spudded and shut down.
Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Blk. D-7, E.L.&R.R. Sur.—Shut down 1,749 ft.
Mrs. J. B. McPhee's No. 1 Sam Belt, C Sec. 78, Blk. D-7, E.L.&R.R. Sur.—Location.
Milham Exploration Co.'s No. 1 Bassett, Sec. 76, Blk. Y, W. E. Robertson Sur.—Cem. 6⅝-in. casing 3,986 ft.; drlg. 4,635 ft.
Woodley & Jones' No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G.R.R. Sur.—Shut down 150 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E.L.R.R. Sur.—Fishing bailer 5,080 ft.

TOM GREEN COUNTY

Collins et al's No. 1 Jones, CSL Sec. 646, Shaffer Sur.—Shut down 1,800 ft.
Fitzgerald & Taliaferro's No. 1 Bennett, C SW Sec. 1,628, E. H. Ringer—Shut down 1,920 ft.
F. P. Green et al's No. 1 fee, 575 ft. from N and 1,450 ft. from W lines Sec. 165, District 11, S.P.R.R. Co. Sur.—Shut down 1,931 ft.
Williams et al's No. 1 Willeke, 2,500 ft. N and 75 ft. E of SW cor. Sec. 3, Deaf & Dumb Asylum Land—Drlg. 460 ft.

UPTON COUNTY

Wentz Oil Co.'s No. 5 Shirk, 2,310 ft. N and 1,650 ft. W of SE cor. Sec. 35, Blk. 1, M.-K.-T.R.R. Sur.—Top salt 815 ft.; total depth 1,890 ft.; fishing.

YOAKUM COUNTY

Weekley Oil Corp.'s No. 1 Knight, C NW Sec. 791, Blk. D, John Gibson Sur.—Drlg. 625 ft.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 80, Blk. 4, I.&G.N. Sur., elev. 1,175 ft.—Shut down 4,850 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft.—Gas sand 2,491-2,520 ft.; tested 125,750 ft. gas; reset 8-in. 2,511 ft.; shut down 4,210 ft.
Producers Oil Co. et al's No. 1 Everett Bros., 2,310 ft. S and 330 ft. E of NW cor. Sec. 40, Blk. DB, C.C.S.D.&R.G.N.G. Sur.—Drlg. 2,225 ft.
Dyar Bros. et al's No. 1 Wilson, 6,830 ft. N NE cor. Sec. 1, T.&P. Sur., thence 1,680 ft. E Sec. 115, Blk. E, G.C.&S.F. Sur.—Show oil and gas 1,053 ft.; drlg. 2,820 ft.
Valvert Oil Corp.'s No. 1 Bassett, C NE Sur. 47, Blk. Y—Set 15½-in. casing 767 ft.; set 10-in. casing 1,510 ft.; fishing 3,760 ft.

WARD COUNTY

Gulf Prod. Co.'s No. 4 O'Brien et al, C NW SW Sec. 19, Blk. F, G.M.M.&M.A. Sur.—Set 15½-in. casing 475 ft.; set 10-in. casing 1,153 ft.; top salt 1,290 ft.; drlg. 1,330 ft.
J.H.L. Oil Co.'s No. 2 Hayzlett, 1,100 ft. from SW and 220 ft. from SE line Sec. 17, Blk. 5, H.&T.C.—Shut down 450 ft.; repairing rig.
E. B. Lovelace et al's No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line, Sec. 162, Blk. 34, E.&T.C.R.R.—Fishing 960 ft.

WINKLER COUNTY

American Maracaibo Co.'s No. 2 Hendricks-B, 1,980 ft. N and 1,650 ft. E of SW cor. Sec. 28, Blk. B-5—Rigging up rotary.
Atlantic O. P. Co.'s No. 5 Hendricks, 1,320 ft. S and 2,310 ft. W NE cor. Sec. 44, Blk. 26—Running 12½-in. casing 570 ft.
M. J. Barbara's No. 1 fee, 990 ft. N and 2,310 ft. E of SW cor. Sec. 17, Blk. B-3—Location.
Barnsdall Oil Corp.'s No. 2 Tobe Morton, 1,650 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12—Cem. 8¼-in. 2,758 ft.; top lime 2,571 ft; cmtng. 8¼-in csg. 2,758 ft.; set 5-in. casing 2,996 ft.
Barnsdall Oil Corp.'s No. 3 Tobe Morton, 990 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12—Cellar.
Empire Gas & Fuel Co.'s No. 1-B Daugherty, 2,310 ft. S and 990 ft. W of NE cor. Sec. 3, Blk. 74—Top lime 2,823 ft.; oil and gas show at 3,165 ft.; drlg. 3,378 ft.; flowing 15,000 bbls. daily; cem. 6⅝-in. casing 3,382 ft.; total depth 3,440 ft.; underreaming 6⅝-in. casing.
Gulf Prod. Co.'s No. 4 Cowden, 495 ft. N and 330 ft. E of SW cor. of 240-ac. lease, Sec. 3, Blk. B-12—Top lime 2,524 ft; cmtng. 8¼-in. casing 2,529 ft.; drlg. 2,771 ft.
Humble O. & R. Co.'s No. 10 Hendricks-C, Lease 2, 2,200 ft. S and 330 ft. E of NW cor. Sec. 10, Blk. B-12—Drlg. 600 ft., sand.
Prairie O. & G. Co.'s No. 2 Daugherty, 330 ft. S and 990 ft. E of NW cor. Sec. 16, Blk. 74—Cem. 12½-in. casing 158 ft.; drlg. 1,250 ft.
Prairie Oil & Gas Co.'s No. 1 Scarborough, 990 ft. N and 1,650 ft. W of SE cor. Sec. 1, Blk. C-22—Cem. 12½-in. casing 260 ft.; top salt 1,400 ft.; set 8¼-in. casing 2,845 ft.; drlg. plug.
Shell Pet. Co.'s No. 1 Leck, 990 ft. S and 1,650 ft. E of NW cor. Sec. 3, Blk. 74—Location.
Shell Pet. Co.'s No. 5 Scarborough, 330 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. C-22—Top salt 1,110 ft.; drlg. 3,015 ft.
Skelly Oil Co.'s No. 1 Leck, 440 ft. N and 330 ft. E of SW cor. Sec. 22, Blk. 26, School Land—Top lime 2,444 ft; cmtng. 8¼-in. casing 2,450 ft.; drlg. 2,860 ft.
Skelly Oil Co.'s No. 2 Hendricks-C, 1,320 ft. N and 2,310 ft. W of SE cor. Sec. 10, Blk. B-12—Top lime 2,636 ft.; cem. 8¼-in. 2,642 ft.; rigging up standard tools.
Southern Crude O. P. Co.'s No. 6 Hendricks T-67-3-A, 990 ft. S and 1,650 ft. W of NE cor. Sec. 4, Blk. B-12—Cmt. 12½-in. csg. 2,245 ft; drlg. 2,608 ft.
Southern Crude O. P. Co.'s No. 5 Hendricks T-67-F, 330 ft. N and 990 ft. W of SE cor. Sec. 33, Blk. B-5, School Land—Top lime 2,711 ft.; cem. 8¼-in. casing 2,784 ft.
Simms Pet. Co. et al's No. 2 Sealey, 2,434 ft. S and 990 ft. W of NE cor. Sec. 50, G.M.M.&A. Sur.—Rotary rig.
Southern Crude O. P. Co.'s No. 8 Hendricks T-88-C, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 28, Blk. B-5, School Land—Drlg. 1,050 ft.
Southern Crude O. P. Co.'s No. 6 Hendricks T-88-K, 2,200 ft. S, 1,650 ft. W of NE cor. Sec. 41, Blk. 26—Cem. 12½-in. casing 876 ft.; drlg. 1,733 ft.
Southern Crude O. P. Co.'s No. 3 Hendricks T-88-O, 440 ft. S, 330 ft. W of NE cor. Sec. 28, Blk. 26—Drlg. 1,115 ft.
Southern Crude O. P. Co.'s No. 2 Hendricks T-88-Q, 440 ft. S and 330 ft. E of NW Sec. 27, Blk. 26, School Land—Top lime 2,375 ft; cmtng. 8¼-in. casing 2,387 ft.; drlg. 2,557 ft.
Southern Crude O. P. Co.'s No. 1 Hendricks, T-88-CX, 440 ft. N and 330 ft. W of SE cor. Sec. 21, Blk. 26, School Land—Cem. 12½-in. casing 780 ft.; top lime 2,390 ft.; cem. 8¼-in. casing 2,402 ft.; drlg. 2,565 ft.
Southern Crude O. P. Co.'s No. 7 Hendricks T-88-H, 2,310 ft. N and 990 ft. E of SW Sec. 28, Blk. B-5, School Land—Drlg. 2,300 ft.
Southern C. O. P. Co.'s No. 6 Hendricks T-88-D, 440 ft. N and 1,320 ft. W of SE cor. Sec. 4, Blk. B-12—Top lime 2,558 ft; cmtng. 8¼-in. casing 2,578 ft.; drlg. 2,897 ft.
Southern Crude O. P. Co.'s No. 6 Hendricks T-89-J, 2,200 ft. S and 330 ft. W of NE cor. Sec. 9, Blk. B-12—Drlg. 552 ft.
Southern Crude O. P. Co.'s No. 7 Hendricks T-89-J, 1,540 ft. from N and 1,320 ft. from E lines Sec. 9, Blk. B-12—Rigging up rotary.
Texas Canadian Oil Co.'s No. 1 Kloh-Rumsey, 1,320 ft. N and E of SW cor. Sec. 35, Blk. 46, T.&P.R.R. Sur.—Total depth 900 ft.; drlg. by tools.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 43)

COTTLE COUNTY

Explin. Co.'s No. 1 Richards ..... Drlg. 3,425 ft.
Explin. Co.'s No. 4 Matador Land & Cattle Co., C Sec. 46, J. H. Stephens Sur. ..... S.D. 3,227 ft.
Sun Oil Co.'s No. 1 T. B. Yarborough, 485 ft. S and 2,460 ft. E NW cor. Sec. 651, Block H, W.&N.W. Sur. .. Drlg. 3,670 ft.

DONLEY COUNTY

Beaudoin et als' No. 1 Ball, 1,075 ft. from N line and 985 ft. from E line, Sec. 22, Blk. E, D.&P.R.R. Sur. Location.
Marine Oil Co.'s No. 1 Sawyer, C SW, Sec. 5, Blk. G, G.C.&S.F. Sur. ..... Drlg. 650 ft.

GRAY COUNTY

Anderson et als' No. 1 Heitholt, C NE SW, Sec. 152, Blk. 3, I.&G.N. Sur. ..... Spud. and S.D.
B. S. Arnold's No. 1 J. E. Mingale, C E 160 ac., Sec. 212, Blk. B-2, H.&G.N. Sur. ..... S.D. 1,412 ft.
Barnsdall Oil Corp.'s No. 1 M. B. Davis, NW cor. W½ SE, Sec. 9, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,227 ft.
Camel Oil Co.'s No. 1 Harrah-B, 330 ft. each way from NW cor. NE, Sec. 150, Blk. 3, I.&G.N. Sur. ..... Rig.
Crabtree Drlg. Co.'s No. 1 B. F. Talley, SW NE, Sec. 114, Blk. M-2, B.S.&F. Sur. ..... S.O. 2,400 ft; S.D. 2,735 ft.
Cockrell-McElroy et als' No. 1 McConnell, 330 ft. each way from NE cor. W½ SW, Sec. 174, Blk. 3, I.&G. N.R.R. Sur. ..... Drlg. 2,110 ft.
Cockrell-McElroy Oil Co.'s No. 2 McConnell, 330 ft. S and E of NW cor. W½ SW, Sec. 174, Blk. 3, I.&G. N.R.R. Sur. ..... Location.
Constantine et als' No. 1 Dial, 330 ft. S and E of NW cor. W½ NW, Sec. 32, Blk. 25, H.&G.N. Sur. ..... Drlg. 2,770 ft.
Danciger et als' No. 1 Shaw, 1,000 ft. N and 330 ft. W SE cor. SW, Sec. 5, Blk. 1, A.C.H.&B. Sur. ..... 35,000,000 ft. gas 2,230 ft; show oil 2,610-13 ft; drlg. 2,666 ft; small spray oil.
Danciger et als' No. 1 J. E. Williams, 330 ft. each way from NE cor. NW SW, Sec. 6, Blk. 1, A.C.H.&B. Sur. Drlg. 2,885 ft.
Danciger et als' No. 1 Sheridan, SE cor. Sec. 184, Blk. B-2, H.&G.N.R.R. Sur. ..... Location.
Dye & Gillette's No. 1 J. L. Noel, 330 ft. each way from SE cor. E½ NE, Sec. 187, Blk. 3, I.&G.N.R.R. Sur... Location.
Empire G. & F. Co.'s No. 1 A. R. Clay, NE cor. Sec. 185, Blk. B-2 ..... 3,288 ft; 300 ft. oil; 1,000 ft. wtr. 3,364 ft; to P.B.
Eslick & McKinney's No. 1 Mrs. Hopkins, 330 ft. from NE E½ NE, Sec. 84, Blk. B-2, H.&G.N. Sur. ..... S.D. 2,865 ft.
Sines & Reiger's, formerly Eslick et als' No. 1 Mrs. J. A. Hopkins, NW cor. W 80 ac. of SW, Sec. 84, Blk. B-2, H.&T.C. Sur. ..... Pull 6-in. csg. 3,206 ft.
Gardner Bros. and Collins' No. 1 Lincoln-Saunder, 330 ft. S and W of NE cor. W½ NE, Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Location.
Gardner Bros. & Collins' No. 2 Saunders, 350 ft. from N on center line of W 68 of W½ of E½ of J. G. Eustis Sur. ..... Location.
Independent O. & G. Co.'s No. 1 Hottenbeck, 990 ft. each way from NE cor. NE, Sec. 176, Blk. 3, I.&G. N.R.R. Sur. ..... Spud.
Magnolia Pet. Co.'s No. 1 Gething, 530 ft. each way from SE SW, Sec. 14, Blk. A-9, H.&G.N. Sur. ..... Drlg. 2,825 ft.
Malone et als' No. 1 Taylor, 990 ft. S and E of NW cor. NW, Sec. 22, Blk. B-2, H.&G.N. Sur. ..... 600 ft. oil top of G.W. 3,024 ft; T.D. 3,235 ft; to P.B.
McLain Oil Co.'s No. 1 Back, 1,000 ft. from W line and 330 ft. from N line, NW, Sec. 24, Blk. 25, H.&G. N. Sur. ..... Drlg. 1,710 ft.
McMan O. & G. Co.'s No. 1 Saunder, 330 ft. N and E of SW cor. E 80 acres W½ of E½, J. G. Eustice Sur. ..... Rig.
Midwest O. & G. Co.'s No. 1 Bower-B, 1,650 ft. from E and 330 ft. from N lines, Sec. 93, Blk. B-2, H.&G. N.R.R. Sur. ..... Drlg. 3,110 ft.
Naboh Oil Co.'s No. 2 Morse, 660 ft. from W line and 330 ft. from S line SW, Sec. 67, Blk. 25, H.&G.N. R.R. Sur. ..... Cellar.
Panhandle Ref. Co.'s No. 1 Saunder, 330 ft. S and E of NW cor. E½ NE, Sec. 3, Blk. 1, A.C.H.&B. Sur. .... Location.
Parton & Holt's No. 1 Gething, 330 ft. each way from SE cor. NE, Sec. 14, Blk. A-9 ..... S.D. 2,980 ft.
Phillips Pet. Co.'s No. 5 Johns, 330 ft. N and 990 ft. E of SW cor. SW, Sec. 87, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,870 ft.
Purple Sage Oil Co.'s No. 2 E. B. Johnson ..... 2,000,000 ft. gas; 200 ft oil 2,870 ft; shot with 510 qts. 2,775-2,872 ft; 400 ft. oil; S.D. 2,875 ft.
Schwald et als' No. 1 fee, 330 ft. each way from NE cor. E½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,571 ft.
Shamrock Pet. Co.'s No. 2 Chapman-A, 990 ft. E and 330 ft. from S lines S½ SW, Sec. 70, Blk. 25, H.&G. N.R.R. Sur. ..... Location.
Shell Pet. Corp.'s No. 2 McConnell, 330 ft. S and E of NW cor. E½ SW, Sec. 174, Blk. 3, I.&G.N.R.R. Sur.. Drlg. 1,000 ft.
St. Clair Oil Co.'s No. 1 Dial, 330 ft. S and W of NE cor. SE, Sec. 10, Blk. 25, H.&G.N.R.R. Sur. ..... Cellar.
St. Clair Oil Co.'s No. 1 Rowe, Sec. 32, Blk. R ..... Fish. 2,890 ft.
St. Clair Oil Co.'s No. 1 L. S. Stockton, SE cor. Sec. 35, W. R. Lee Sur. ..... Spudded and S.D.
Southern Pet. Exp. Co.'s No. 3 McConnell, 1,650 ft. from W line and 330 ft. from S line NW, Sec. 174, Blk. 3, I.&G.N.R.R. Sur. ..... Drlg. 2,385 ft.
Southern Pet. Exp. Co.'s No. 4 McConnell, 330 ft. N and E of SW cor. NW, Sec. 174, Blk. 3, I.&G.N.R.R. Sur.. Location.
The Texas Co.'s No. 6 Davis, 330 ft. S and 1,650 ft. W NE cor. NW, Sec. 86, Blk. 3, I.&G.N.R.R. Sur. ..... Drlg. 2,580 ft.
The Texas Co.'s No. 1 Faulkner, 330 ft. each way from NW cor. Sec. 29, Blk. B-2, H.&G.N. Sur. ..... Bldg. rig.
The Texas Co.'s No. 2 McLarty-B, at center of J. M. Rose Sur. ..... Rig.
The Texas Co.'s No. 10 Saunders, 330 ft. N and W of SE cor. W½ of J. G. Eustis Sur. ..... Drlg. 1,920 ft.
Travis et als' No. 2 Back, 330 ft. each way from NW cor. E½ SE cor. Sec. 44, Blk. 25, H.&G.N.R.R. Sur... Rig.
Travis et als' No. 1 J. S. Morse, SE NW SW, Sec. 68, Blk. 25, H.&G.N. Sur. ..... 30,000,000 ft. gas 2,592-2,610 ft; light spray oil 2,740-45 ft; to deepen.
Wilcox-Pampa Oil Co.'s No. 31 Worley Reynolds, 330 ft. N and E SW cor. SE SW, Sec. 61, Blk. 3, I.&G.N... S.O. 2,928 ft; drlg. 3,105 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood, 320 ft. from N and W lines, League 7, Wilbarger County school lands; elevation 3,363 ft.; contract depth 5,000 ft. ..... S.D. 1,455 ft.

HARTLEY COUNTY

Amarillo Oil Co.'s No. 9 Lee Bivins "A," C NW, Sec. 6, Blk. 21 ..... 15,000,000 ft. gas 3,300-35 ft; T.D. 3,601 ft.
Canadian River Gas Co.'s No. 10 Burns-A, 660 ft. N and 660 ft. E, Sec. 18, Blk. 2, G.&M. Sur. ..... Drlg. 1,371 ft.

HUTCHINSON COUNTY

Antelope Creek Oil Co.'s No. 3 Sanford, 330 ft. from N line and 330 ft. from W line of E½ S 160 ac. of Sec. 32, Blk. 46, H.&T.C. Sur. ..... C.O. 3,085 ft.
Amarillo Oil Co.'s No. 2 Ingerton-A, 1,650 ft. from N line, 1,071 ft. from E line Sur. 41, H.&T.C.R.R. Sur... Rig.
Dunnigan et als' No. 1 C. W. Hugenbyhl, 330 ft. from S line and 330 ft. from E line, N½, Sec. 4, Blk. T. W.&N.G.R.R. Sur. ..... Shot with 60 qts. 3,110-40 ft; swb. 20 bbls; to shoot again.
Marland Prod. Co.'s No. 1 Johnson-C, 450 ft. S and W of NE cor. Sec. 5, Blk. 1, B.&B. Sur. ..... Drlg. 1,965 ft.
Oil Operators Trust Co. and Marland's No. 2 J. M. Stanford-B, Sec. 82, Blk. 46, H.&T.C. Sur. ..... S.D. 3,039 ft.
Phillips Pet. Co.'s No. 2 Jasper, 980 ft. from S line and 660 ft. from E line SE, Sec. 23, Blk. M-23, T.C.R. R. Sur. ..... 400 ft. oil 3,072-3,122 ft.
Phillips Pet. Co.'s No. 4 Johnson-Pulaski, 330 ft. from N line and E line of W½, Mary Whitley Sur. ..... Location.
Phillips Pet. Co.'s No. 5 Johnson Bros. (Florence), 330 ft. each way from S and E line of E½, Mary Whitely Sur. ..... Location.
Phillips Pet. Co.'s No. 6 (Florence), 330 ft. each way from S and W lines, E½ ..... Location.
Phillips Pet. Co.'s No. 3 Sanford-Garland, 330 ft. N and E of SW cor. Sec. 77, Blk. 46, H.&T.C. Sur. ..... Drlg. 2,700 ft.
Phillips Pet. Co.'s No. 16 Whittenburg, Sec. 63, Blk. 46, H.&T.C. Sur. ..... Drlg. 2,715 ft.
The Texas Corp.'s No. 2 Moore, 990 ft. from N line and 330 ft. from W line SW, Sec. 125, Blk. 4, I.&G.N. Sur. Drlg. 920 ft.
Timms et als' No. 1 Moore, 330 ft. N and E of SW cor. S 40 ac. NW, Sec. 21, Blk. M-21, T.C.R.R. Sur. ..... Drlg. 1,025 ft.

KING COUNTY

The Texas Co.'s No. 1 J. H. Johnson ..... S.D. 4,300 ft.
Huff Oil Co.'s No. 1 Martin, 1,320 ft. from N line and 1,320 ft. from E line Sec. 171, Blk. F, H.&T.C. Sur... Rig.

LAMB COUNTY

Dan Freel et als' No. 1 Ellwood, CWL, Sec. 9, Blk. T, T. A. Thompson Sur. ..... Spudded and S.D.

LIPSCOMB COUNTY

Brown et als' No. 1 Box T Ranch, SW NE, Sec. 612, H.&T.C. Sur. ..... S.D. 3,128 ft.
Ruby Oil Co.'s No. 1 C. W. Jones, NE SW, Sec. 100 H.&T.C. Sur. ..... Straightening crooked hole 4,428 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch ..... Small show oil 1,133-40 ft; sand; fish. 4,105 ft.

MOORE COUNTY

Amarillo Oil Co.'s No. 2 Warrick, C S 160 ac., Sec. 92, Blk. 46, H.&T.C. Sur. ..... Drlg. 600 ft.
Canadian Gas Co.'s No. 1 Kilgore-A, 2,716 ft. S and 2,695 ft. W of NE cor. Sec. 1, Eustis Sur. ..... Drlg. 2,391 ft.
Devonian Oil Co.'s No. 1 Sneed, 330 ft. N and 2,335 ft. W of SE cor. of S 160 ac. of N 320 ac., M. Robinson Sur. ..... Drlg. 2,600 ft.
Dixie Creek Oil Co.'s No. 1-A Sneed, Jr., 330 ft. N and W of SE cor. E½, Sec. 65, Blk. 3, G.M. Sur. ..... 400 ft. oil 3,305-15 ft; H.F.W. at 3,330 ft; P.B. to 3,316 ft; shot with 30 qts. 3,241-68 ft and 50 qts. 3,283-3,316 ft; C.O.
Dixie Creek Oil Co.'s No. 4-A Sneed, Jr., 330 ft. S and W of NE cor. E½, Sec. 65, Blk. 3 ..... 10,000,000 ft. gas 2,835-55 ft; 50 ft. oil 3,304-05 ft; H.F.W. 3,354 ft; P.B. to 3,336 ft; shot with 55 qts. 3,305-25 ft. and second shot 3,217-38 ft; C.O.
Fritch O. & G. Co.'s No. 1 Lee Burns, C NE 40 ac. of N 160 ac., Sec. 4, Geo. Mahan Sur. ..... Spudded and S.D.
McMan O. & G. Co.'s No. 2 Sneed, 2,260 ft. S and 990 ft. W of NW cor. J. W. Proctor Sur., located in M. Robinson Sur. ..... Drlg. 3,134 ft.
Skelly Oil Co.'s No. 6 Armstrong & Byrd, 1,600 ft. S and 990 ft. E NW cor. of J. N. Proctor Sur. ..... Drlg. 1,570 ft.
Skelly Oil Co.'s No. 7 Armstrong & Byrd, 2,260 ft. S and 990 ft. E NW cor. J. N. Proctor Sur. ..... Drlg. 1,020 ft.
Phillips Pet. Co.'s No. 1 Burnett, 330 ft. each way from NE cor. NE, Sec. 192, Blk. 3-T, T.&N.O. Sur... Drlg. 3,105 ft.
Phillips Pet. Co.'s No. 3-A Sneed, Jr., 1,600 ft. S and 430 ft. W of NW cor. J. N. Proctor Sur. ..... Drlg. 2,060 ft.
Phillips Pet. Co.'s No. 4 Sneed, 1,600 ft. S and 990 ft. W of NW cor. J. W. Proctor Sur., and located in M. Robinson Sur. ..... Drlg. 2,865 ft.
Phillips Pet. Co.'s No. 1 Taylor, 330 ft. N and E of SW cor. E½ NW cor. Sec. 244, Blk. 3-T, T.&N. O. Sur. ..... Drlg. 2,333 ft.

MOTLEY COUNTY

Explin. Co.'s No. 1 Tillson ..... Drlg. 3,670 ft.
Explin. Co.'s No. 5 Matador, C, Sec. 45, Blk. J-B, C.B. &C.N.G.R.R. Co. Sur. ..... Rig.
Explin. Co.'s No. 6 Matador, 330 ft. from N line and 330 ft. from E line, Sec. 132, Blk. M ..... Rig.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Ledrick, Sec. 7, Blk. 5-A ..... Formerly abd. at 5,240 ft; small show 36 gravity oil 5,288-91 ft; show oil brown sand 5,710-12 ft; 300 ft. wtr; S.D. 5,975 ft; to P.B. and shoot.

WHEELER COUNTY

Angus et als' No. 2 Morgan, C E½ NW NE, Sec. 93, Blk. 17, H.&G.N. Sur. ..... Drlg. 1,930 ft.
Arnold Oil Co. et als' No. 1 Ritchey, 420 ft. from E and 460 ft. from S lines of NW cor. Sec. 5, Blk. 24, H.&G.N. Sur. ..... Cmtd. 8-in. 1,997 ft.
Byrens et als' No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H.&G.N. Sur. ..... S.D. 2,920 ft.
Clark et als' No. 4 Purcell, C SW SW, Sec. 51, Blk. 17, H.&G.N.R.R. Sur. ..... Drlg. 1,825 ft.
Edward's No. 1 Griswald, 660 ft. N and E of SW cor. SW, Sec. 1, Blk. 2, H.&G.N.R.R. Sur. ..... Location.
Fain-McGaha and Humble's No. 1 Noel, 330 ft. each way from NE cor. S½ SE, Sec. 54, Blk. 24, H.&G. N. Sur. ..... Drlg. 2,560 ft.
Gibson Oil Co.'s No. 6 Bentley, 330 ft. S and E of NW cor. SE SE, Sec. 42, Blk. 24, H.&G.N.R.R. Sur. ..... Swb. 60 bbls. 12 hrs. 2,347-60 ft.
Johnson & Co.'s No. 1 Purcell, 430 ft. from N line and 570 ft. from W line NE, Sec. 50, Blk. 17, H.&G.N. Sur. Drlg. 1,730 ft.
Lone Star Co.'s No. 1 Hicks, C SW NE, Sec. 52, Blk. 17, H.&G.N. Sur. ..... Rig.
Lone Star Gas Co.'s No. 4 Jones, C SE NE, Sec. 1, Blk. 24, H.&G.N. Sur. ..... Drlg. 1,745 ft.
Lone Star Gas Co.'s No. 1 Turnbow, C NE SW, Sec. 67, Blk. 17, H.&G.N.R.R. Sur. ..... Drlg. 925 ft.
Mudge Oil Co.'s No. 1 Hicks, C SW SW, Sec. 52, Blk. 17, H.&G.N.R.R. Sur. ..... Cmtd. 8-in. 1,720 ft.
L. W. Rook's No. 1 M. Nelson, C SW NE, Sec. 5, Blk. 24 H.&G.N. Sur. ..... S.D. 2,020 ft.
Swain & Miller's No. 1 Woodley, C NW NW, Sec. 21, Blk. 24, H.&G.N.R.R. Sur. ..... Drlg. 1,410 ft.
The Texas Co.'s No. 1 Gordon, 330 ft. N and 405 ft. W SE cor. NW, Sec. 91, Blk. 17, H.&G.N.R.R. Sur. ..... C.O. 1,840 ft.
L. W. Rook's No. 2 A. Smock, C SW SE, Sec. 5, Blk. 24, H.&G.N. Sur. ..... Rig.
Vaughn et als' No. 1 Woodley, C NE NE, Sec. 21, Blk. 24, H.&G.N. Sur. ..... Drlg. 1,760 ft.
Wisch Kamper's No. 1 Adamson, C NE SE, Sec. 50, Blk. 17, H.&G.N.R.R. Sur. ..... Drlg. 1,600 ft.
Upham Gas Co.'s No. 1 Raybo, C S½ NW NW, Sec. 105, Blk. 23, H.&G.N. Sur. ..... Drlg. 910 ft.

GOVERNORS OPPOSE NEW REGULATIONS ON PERMITS

(Continued from Page 36)

permits pending in the office of the First Assistant Secretary of the Interior, under the general leasing act, will be returned to the General Land Office.

2. All oil and gas cases pending in the office of the Solicitor will be reviewed to determine their present status. Those coming within the new policy should be returned to the General Land Office.

3. The preparation of letters in the General Land Office calling upon delinquent permittees to show cause why their permits should not be canceled will be expedited.

4. Oil and gas permits now in good standing will not be proceeded against so long as the terms of the permits are being timely complied with.

5. Where a permittee is entitled to a lease because of discovery, it is mandatory to lease only one-fourth of the area, under strict interpretation of the President's policy, except that when the permit covers 160 acres or less, the permittee would be entitled to lease the full acreage. The remainder will not be leased unless such action is required in the public interest.

6. The departmental committee, consisting of the Solicitor, the Commissioner of the General Land Office, and the Director of the Geological Survey, will consider the extent of operations which have been prosecuted under existing oil and gas permits, to determine whether permittees have acquired equities which should be recognized and make appropriate recommendations to the Secretary. In reviewing permits, representative cases may be recommended for public hearing before the Secretary of the Interior to determine lines of policy.

7. Registers of local land offices will not receive applications for oil and gas permits after March 12, 1929, and will reject all pending applications for permits. They will forward to the General Land Office all applications for extensions of time, etc., relative to outstanding permits.

8. Applications for extension of permits on hand should be disposed of promptly. Those not involving expenditure of money in development work will be denied by the General Land Office. All other cases will be referred to the special committee by memoranda of the General Land Office showing the facts disclosed by the record, and of the Geological Survey as to the status of development work.

9. The General Land Office will hold for cancellation, allowing 15 days in which to show cause, all permits on which there is no prima facie evidence that expenditure of money in development work has been made. All other cases should be referred to the special committee by memoranda of the General Land Office showing the facts disclosed by the record and of the Geological Survey as to status of development work.

10. All oil and gas permits in the Geological Survey pending report to the General Land Office will be promptly considered under the new policy. Where these cases involve conflict of agricultural and mineral rights, or questions of similar character, they should be completed by the Geological Survey. All others should be returned to the General Land Office with appropriate report when such is required under the new policy; otherwise without report.

11. Supervisors of oil and gas operations in the Geological Survey must deny approval to notices of intention to drill on permits that are not shown to be in good standing by the terms of the permit itself or an approved extension of time.

12. The Geological Survey will report to the Secretary on the likelihood of oil and gas drainage of government lands in various producing and wildcatting fields where a claim of drainage is made. The special committee will consider the question of drainage only when incidentally involved in individual permits before it for consideration.

13. Permits issued and outstanding in Executive Order Indian Reservations under the act of March 3, 1927, will be considered and disposed of in the same manner as provided in the foregoing paragraphs.

Protest by Operators

Direct issue with the interpretation is taken by the operators. They quote the last sentence in Section 14, of the Act of Feb. 25, 1920, to sustain their position, this sentence reading as follows:

"The permittee shall also be entitled to a preference right to a lease for the remainder of the land in his prospecting permit at a royalty of not less than 12½ per centum in amount or value of the production, and under such other conditions as are fixed for oil or gas leases in this act, the royalty to be determined by competitive bidding or fixed by such other methods as the Secretary may by regulations prescribe: Provided, That the Secretary shall have the right to reject any or all bids."

It is contended by those opposing this regulation that under the provisions of Section 14 the only thing the Secretary can do is to fix the method of determining the royalty. It is asserted that the words the permittee "Shall be entitled to a preference right to a lease" is mandatory and the Secretary's discretion lies only in determining the royalty.

The first regulations issued under that provision for fixing the royalty gave the permittee the refusal of a lease on the basis of royalty determined by the highest bid, but it lasted only a short time. Delegations went to Washington and in conference explained that if permittees went to the expense of geologizing the land, building roads, drilling a well and getting oil and pay all the costs, somebody else could step in bid a higher royalty than an operator could afford to pay so that the preferential right did not amount to anything. Then it was decided to fix the royalty by regulation. The royalty fixed for leases under Section 18 of the act was adopted. It provided a royalty of 12½ per cent on the first 20 barrels; 16⅔ per cent on the next 20 to 50 barrels; 20 per cent on the next 50 to 100 barrels; 25 per cent on the next 100 to 200 barrels; and 33⅓ per cent on all above 200 barrles for oil of 30 gravity, or better, and lower schedules for oil below 30 gravity. That basis for royalty oil has remained in effect on preference leases ever since, the royalty on primary leases being fixed by the statute. The new policy as outlined in the dispatches withdraws entirely the right to preference leases without which it is doubtful if any company would drill on permit land, but which it is contended the administration can not take away from it.

Policy Questioned

Under date of February 2, 1929, the Department of the Interior released a press memorandum which said:

"The general policy of the Federal Government as reflected in recent legislation is to retain the ownership of the principal natural resources of its remaining public lands, permitting the development of these resources only under lease or permit." Prior to that time the Government disposed of its public land by conveying title. Instead of selling, it turned to leasing. The new policy is to discontinue the leasing of the public domain except where it is mandatory as well as retaining the ownership. The same statement pointed out that the public lands amount to 194,000,000 acres, equal in area to 14 of the smaller states. In addition to this the mineral rights on about 19,000,000 acres of land patented under the stockraising laws have been retained. Whether the new policy will force a big drilling campaign on permits to comply with the terms to the letter, cause the operators to withdraw and take their losses where drilling has not commenced, or bring about litigation to determine the powers of the Secretary of the Interior, is not yet quite clear.

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Shale-Gas Wells Now Are Profitable

Industry in Eastern Kansas Has Good Market for Product, Low Cost of Operation, Few Dry Holes and Slow Decline

By Homer H. Charles and James H. Page*
Geologists, Oklahoma Natural Gas Corp., Tulsa

The shale-gas industry of eastern Kansas is the result of the depletion of the sand-gas reserves of that area. A good market for the gas, the unique feature of the wells whereby as much as 70 per cent of the open flow may be taken without injuring them, their slow decline and promise of long life, the low cost of operation, and the extremely small percentage of dry holes make this industry profitable, especially to those who drill their own wells and manage their own properties.

The presence of shale-gas in eastern Kansas has been known since drilling for oil and gas began many years ago. Because of the small volumes encountered and the accompanying troublesome salt water, shale gas was not then considered of commercial value. Changed economic conditions since have made it worth producing.

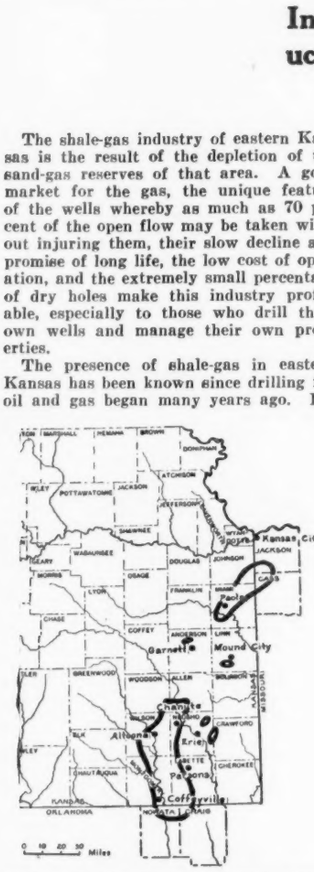


Figure 1.—Outline map of eastern Kansas and adjoining territory showing areas in which shale-gas occurs.

History of the industry dates back only to 1921, when the first shale wells were completed in the southwest Chanute district. A few shale wells had been producing previously, notably at Cherryvale, where homes were supplied by private lines. About 1910 a shale well near Chanute was put on the line after a patented device to separate the gas and salt water had been installed by the owner. However, concerted effort to produce shale-gas did not begin until eight years ago, and the most active drilling for it has taken place since 1924. Now, hundreds of wells, marked by the vertical drips at the well mouths, are scattered through eastern Kansas, and are helping to take the place of the large sand wells of former years.

The areas in which shale-gas is known to occur are shown in Figure 1. Most of them have pipe line connections. The territory southwest of Chanute is the oldest producing area. Activity spread from there through the Altoona-Neodesha district and in the vicinity of Independence and Cherryvale. Shale wells are found north of Coffeyville and south of that city in Oklahoma. The latest drilling has taken place in the Paola district in Johnson and Miami Counties, Kansas, and in Jackson and Cass Counties, Missouri.

Source of the Gas

The most widespread strata that furnish the gas are black, highly carbonaceous shales, ranging from 3 to 12 feet in thickness, both immediately above and beneath the lowest limestone of the Fort Scott member of the Marmaton formation. This lowest limestone maintains a remarkably constant thickness of approximately 5 feet in the southeastern part of Kansas, and is invariably designated as the "5-foot lime" by drillers and operators. Above the black shale overlying the "5-foot lime" is an upper limestone member of the Fort Scott. It is designated as the "20-foot lime" because of its rather uniform thickness. The black shale beneath the "5-foot lime" gives up the greater amount of gas.

Although all the strata between the base of the Fort Scott and the top of the "Mississippi lime" are now classified as of Cherokee age, it seems justifiable, on the basis of their lithologic similarity, to consider the black gas-producing shale at the top of the Cherokee formation as a part of the Fort Scott. The Fort Scott beds range from 650 to 850 feet in depth in the Chanute-Coffeyville area, but only from 400 to 550 feet between Paola and Kansas City.

In scattered areas in eastern Kansas, gas has been encountered in the Galesburg and Ladore shales of the Kansas City formation. Other gas-bearing shales occur locally at depths ranging from 50 to 200 feet below the top of the Cherokee formation. The shales adjacent to the lower Fort Scott limestone bed produce practically all of the eastern Kansas shale gas.

The "Fort Scott" shales, where gas-bearing, are hard, brittle, and carbonaceous, and have a dull, sooty appearance on fresh surfaces. Their color is characteristically coal black, and they give a dark brown streak. The preponderance of rather thin, flat fragments in the drill cuttings indicates that the rock has lamination common to all shales. However, the wavy conchoidal surfaces of the fragments show that the bedding is poorly developed and that the shale is not readily susceptible to parting. The few smooth surfaces at right angles to the bedding are probably joint or fracture planes. The drill cuttings from different wells vary also in size and shape, and these reveal the local differences in hardness and structure of the shale beds.

TABLE 1—ANALYSES OF SHALE-GAS AND SAND GAS*

Source of sample—	Methane (CH_4)	Ethane (C_2H_6)	Carbon dioxide (CO_2)	Nitrogen (N_2)	Heating value B.t.u.	Specific gravity
Colony Field, Anderson County, Kansas† ..	97.2	1.8	1.0	None	1,012	.5713
Blue Mound Field, Linn County, Kansas† ..	86.7	6.0	0.9	6.4	980	.6170
West Chanute Field, Wilson County, Kansas†	94.3	4.2	0.7	0.3	1,025	.5683
Chickasha Field, Grady County, Oklahoma†	93.9	5.5	0.6	None	1,044	.5841
West Chanute Field, Wilson County, Kansas	86.5	9.0	0.3	4.2	1,031	.6166
West Chanute Field, Wilson County, Kansas	89.7	6.0	0.5	3.8	1,009	.6025
West Chanute Field, Wilson County, Kansas	93.3	4.7	0.6	1.4	1,021	.5870
West Chanute Field, Wilson County, Kansas	89.7	6.2	0.6	3.5	1,014	.6030

*Analysed at laboratories of Oklahoma Natural Gas Corp., Tulsa. †Sand gas.

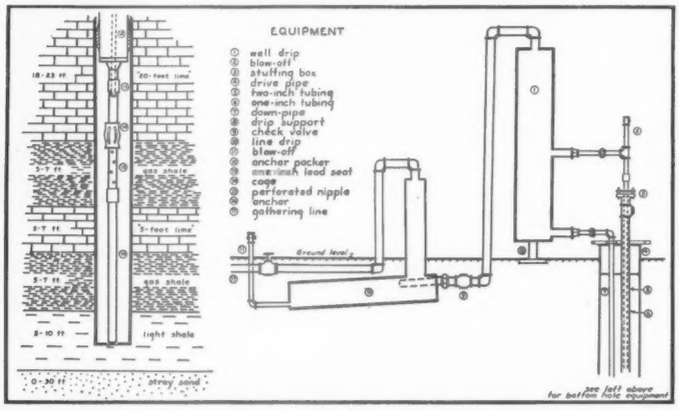


Figure 2.—Equipment of a shale-gas well. The line drip is variable in design as influenced by the ideas of different operators. Thicknesses of formations are typical of the Chanute-Altoona district of Wilson County. The amount of salt water passing through the well drip in a day varies 5 to 10 bbls. The well drip is a section of 6-inch pipe about 8 feet long.

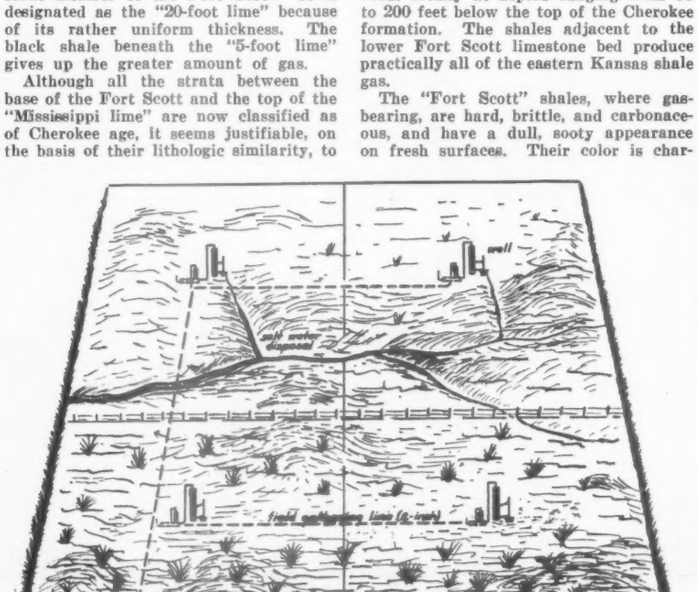


Figure 3.—Sketch showing the development and equipment on a 160-acre tract on which a shale-gas well has been drilled in the center of each 40 acres.

Origin and Composition of the Gas

Any theory that shale-gas had an origin different from that of sand gas does not seem justified. Although the shale-gas of eastern Kansas differs somewhat from sand gas of the same area in chemical composition and heating value (Table 1), its distinguishing difference, in the opinion of the writers, is its occurrence in reservoir rock of a different type—probably rock in which it was generated. Such a black carbonaceous shale seems ideal as a source bed for the gas. The light shale or dense gray limestones above and below the gas-bearing strata give no evidence of being source rocks.

Some people hold the view that the gas owes its origin to chemical action between the salt water almost invariably associated with the black shale and the shale itself, the effect being similar to that produced by the action of water on calcium carbide. Such an idea is unwarranted in view of the supposed reagents. Certain well owners insist that the long life and slow decline of the shale wells can be accounted for only by a constant generation of the gas.

Automatic well drip or separator used on shale-gas wells. Hundreds of these drips now are scattered through some of the eastern Kansas counties.

A current belief among some that the salt water brought to the surface by the gas is returned to the well to bring about the formation of more gas by its action on the shale is without basis because the water is prevented from reaching the shale again by a packer. Furthermore, some of the gas shale in the Paola district and some in the vicinity of Erie yield no water, and in parts of eastern

*Published by permission of the Bulletin of the American Association of Petroleum Geologists. Delivered at the annual meeting of the association in Fort Worth, Tex., March, 1929.

Kansas the Fort Scott shales contain salt water but no gas.

Technical workers maintain that the long life and slow decline of the wells can be explained by the nature of the reservoir rock—that the gas feeds into the wells very slowly from the pores and fractures within which it is stored and is retarded further by slow migration through the spaces between the laminae. Probably the gas is in solution with the salt water. A certain amount of water must be given up by the shales to yield a certain amount of gas. Even so, the dense rock gives up its content very slowly, thus extending the productive period much longer than that of a sandstone reservoir.

A comparison of the composition of shale gas and of sand gas from eastern Kansas is shown in Table 1. Only a trace of natural gasoline is present in shale gas. A sample taken at the Chanute city gate, gas supplied chiefly from shale wells, had a gasoline content of only 5.24 gallons per 1,000,000 cubic feet.

Initial Production

Shale-gas wells have a wide variation in volume. The smallest wells saved may test as little as 10,000 cubic feet per day; the largest, 900,000 cubic feet. In the Chanute-Altoona district of Wilson County, a well is considered of average size if it makes 40,000 cubic feet, and the best wells have a volume of 300,000 feet. Exceptionally large producers have been reported in the Paola-Kansas City shale area, the gauge of some wells producing from shale alone being as much as 900,000 cubic feet. Such large wells blow down rapidly to average volume and may cease producing after a few days, a situation which suggests that the source of gas is a "pocket."

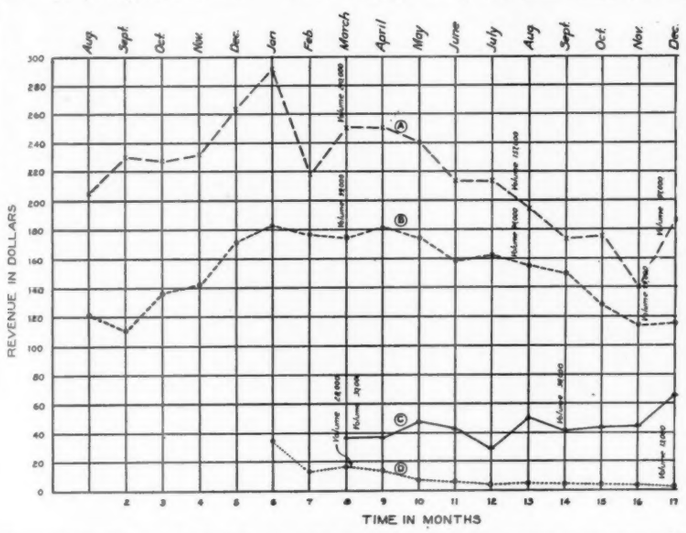


Figure 4.—Decline curves of shale-gas wells showing variation in revenue to operator with net price of $.07 per 1,000 cubic feet. Curves A and B represent wells much larger than the average. They are in the same area and gave like response to operating conditions. The increase in delivery in the last month is due to the lowering of the line pressure. The natural decline of the wells is believed to have begun in March. These wells paid out in six months. Curve C is that of an average well which has a steady production due primarily to its isolated position half a mile from any other well. It delivers approximately 50 per cent of its open flow against 40 pounds line pressure. Curve D represents a shale well that delivers consistently but in too small amounts to be profitable. Open flow of the wells at different times is indicated. Date of curves is from August, 1927, to December, 1928.

Little Known About Rock Pressure

Very little can be learned concerning the rock pressure of shale wells, as it is impossible to shut in the average well without killing it. The only accurate tests known to the writers are of wells which make no water. One well had a shut-in pressure of 170 pounds at a depth of 540 feet; another, 95 pounds at a depth of 410 feet; and a third, 248 pounds at 830 feet.

The reasons for the difference in size of the producers are undetermined as yet, but they are probably related to these factors: (1) local richness of the shale in "gas-making" material, (2) porosity of the shale, (3) amount of fracturing and jointing, and (4) structure. Although the volumes of the wells vary considerably between adjacent locations, areas as large as several square miles contain wells of the same general class. In the greater part of eastern Kansas no gas is found in the shales in the same stratigraphic position as those productive in the shale-gas fields.

Operators and drillers long familiar with production of this type have stated that where the shale is darkest in color the largest wells may be expected. A few gas wells in eastern Kansas produce from seams of coal. Samples of the producing zone taken from some shale wells contain tiny cubes of bituminous coal. These facts strengthen the belief that the volume of the wells is controled largely by the local organic content of the shale.

Although the gas-yielding formation is very fine-textured, its pores probably serve as a reservoir for some of the gas, just as do the pores of a sand. Variations in sedimentation would cause variations in the porosity, which in turn would be reflected by wells of different volume.

Fracturing and Jointing

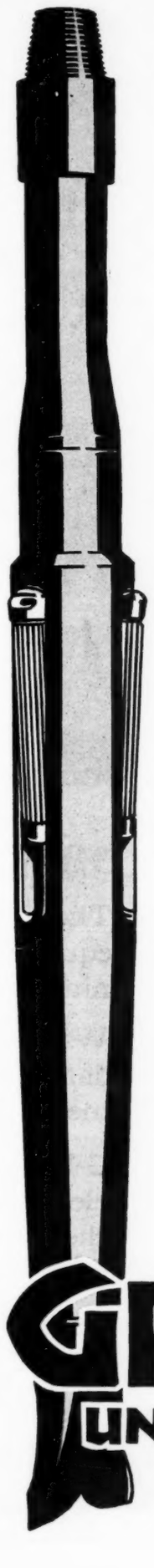
Fracturing and jointing may influence the size of the wells. The amount of fracturing may depend on the intensity of folding or the character of the shale. Where extraordinarily steep dips exist, the shale may have been broken, especially in places where comparatively abrupt changes in dip take place. However, the gentle inclinations of the strata in the gas areas discourage belief that local folding has caused much fracturing. The jointing can be attributed to the same forces that made the joints in the limestones, and is the result of slight regional torsional movements. Shale high in organic material, that which approaches the constituency of bituminous coal, is probably easily jointed. Thus, the organic content of the shale may be important in influencing the amount of fracturing or jointing as well as in determining the quantity of gas originally generated.

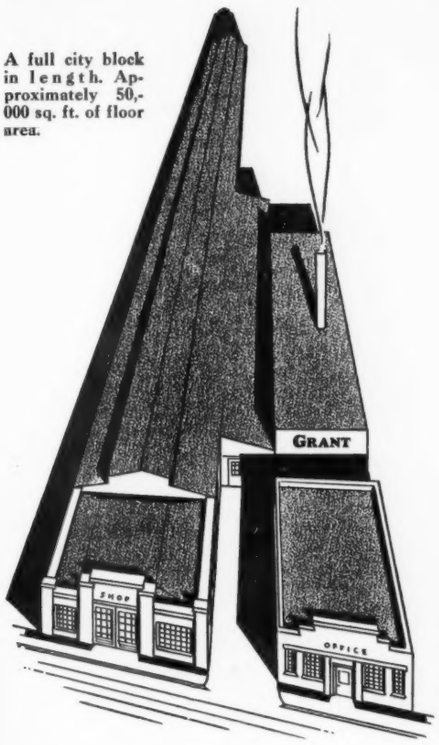
Structure may also influence the size of the producing wells. General observations indicate that shale wells in deep synclines may be expected to be small, though anticlinal folds do not necessarily furnish the largest wells. It has been noticed, however, that showings of gas in shales are more common in wildcat wells on anticlinal structures than in those not so located. The information secured to date does not indicate a definite relation between the size of the wells and structure.

The richness of the shale in organic material and the porosity, caused largely by jointing or fracturing, are believed to outweigh other factors. Subsequent research may alter this view.

Drilling and Equipment

The shale gas wells are drilled with portable drilling machines. An 8-inch





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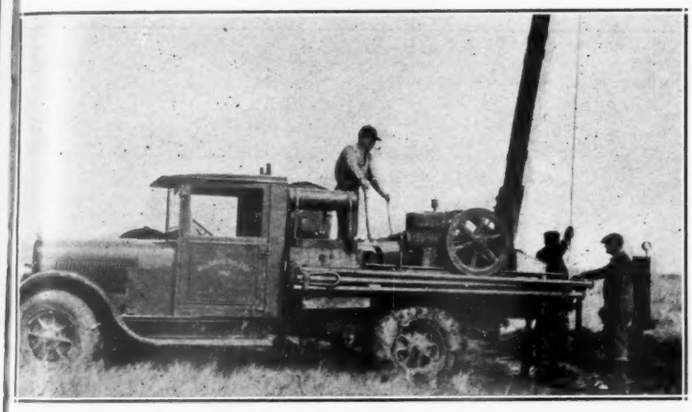
hole is carried to a depth a few feet below the "Big lime" (Winterset, Bethany Falls, and Hertha limestones) where the 6¼-inch casing is set. This casing is pulled after the well is equipped and only the drive pipe is left. The remainder of the hole is drilled with 6-inch tools and is finished just below the lower black shale. It has been proved a good policy to complete the hole 2 to 4 feet in the tight shale beneath the gas-bearing strata.

Within 10 feet below the black shale is an irregularly-occurring sand which may hold gas, heavy oil, or salt water. If this sand is tapped at points where heavy oil is present, the recovery of shale gas is lessened, as the oil clogs the tubing and the well equipment. The salt water from the sand must be lifted with that from the shale, an added burden to the operation of the well. Of course, if gas is encountered, it increases the value of the well, but the uncertainty of finding gas deters most operators from testing the sand.

Some wells which are high structurally are deepened to the Bartlesville sand, 230 to 250 feet below the top of the Cherokee shale. If the Bartlesville and the Cherokee sands above are missing or do not hold gas, the hole is plugged back to the shale zones. Abandoned wells or dry holes that were drilled before the shale-gas industry was developed have been reconditioned by cleaning out the plug to a depth below the Fort Scott limestone. Poor logs have handicapped many such endeavors, and shale wells secured thus are not generally as productive as new wells.



Combination swabbing outfit and air compressor used in reviving "dead" shale-gas wells.

Repairing for Operation

The wells are equipped for operation by running a string of 2-inch tubing. An anchor packer attached to the tubing is set in the "20-foot lime" of the Fort Scott. A pressure chamber is thus created in the lower part of the hole. Below the packer, in order, are a heavy collar containing a machined ring-seat, cage, perforated nipple, and anchor. A string of 1-inch pipe is placed inside the 2-inch. At the end of the 1-inch is a lead seat which bears against the machined ring set in the 2-inch string. The gas and salt water from the shale enter the 2-inch perforated nipple and the cage (Figure 2), and pass up through the 1 inch tubing into a drip or separator at the mouth of the well. The drip is a section of 8-inch pipe with the ends sealed by welded caps. Before entering the lease-gathering system the gas goes through a line drip, additional equipment for eliminating the moisture. The field meter is also protected by a drip. After being measured, the gas enters the main gathering line to be transported to market. Most lease lines are 2 inches in diameter. They are buried or left strung on the ground at the option of the operator. Most lines not larger than 5½ inches in diameter are constructed of welded flues originally used in boilers, or second-grade welded line pipe. All well connections except those that need to be broken frequently are welded.

Suspended in drill hole outside the 2-inch tubing is a string of 1-inch "down-pipe" which conducts away the salt water brought up with the gas. The discharge end is beneath the head of the water in the hole a distance sufficient to form a seal on the drip with pressure greater than the pressure of the field line into which the gas is delivered. The length of the down-pipe ranges from 150 to 250 feet, determined by the amount of pressure in the gathering system. Its two-fold purpose is to carry away the salt water brought from the well and to seal the drip so the gas will be directed into the field line.

Cost of Well

The cost of drilling and equipping an 800-foot shale well in the eastern Kansas district is itemized in Table 2.

TABLE 2—ITEMIZED COST OF AN 800-FOOT SHALE-GAS WELL

Drilling, including pipe rental, 800 feet at $1.10	$880.00
Tubing (2-in.), 800 ft. at $.18½	148.00
Tubing (1-in.), 800 ft. at $.09	72.00
Tubing (1-in. down-pipe), 250 ft. at $.09	22.50
Packer with cage attached	40.00
Machined ring and lead seat	6.00
Perforated nipple 2 feet long	2.50
Stuffing box	2.50
Well drip	8.00
Fittings	5.00
Total cost	$1,186.50

Operators who have their own drilling machines may complete an 800-foot well with a total cash expenditure of approximately $900. Such operators own a large per cent of the eastern Kansas shale wells and are responsible for the present extent of the industry.

Spacing of wells.—By general practice one shale well is drilled in the center of a 40-acre tract (Figure 3). Even this wide spacing may be considered too close. The land divisions, however, make it the most logical system of location. A shale well that is a "clean-out" of a dry hole may be 150-250 feet from property lines, but this close offset may be counteracted by a well an equal distance from the line, but on a part of the lease not offset by the competitor's well. In territory that does not yield large wells and is divided into blocks of leases controlled by a few operators, a shale well to each 80 acres is the most economical spacing.

Operation and Maintenance

The method of operating and maintaining the ordinary shale well is so different from that required for wells producing from sand that it has been thought best to describe the method in detail. In sand wells, salt water is ordinarily troublesome only after the pressure has declined considerably, and then the water encroachment is gradual, but nearly all shale wells make a large amount of water from the beginning and must be equipped to handle this water immediately after being tubed. A correct test of their open flow can not be taken until the well drip is in place. Sand and shale wells, however, have one feature in common—they can be operated profitably only so long as the water can be handled economically. As soon as swabbing is required too frequently, the well must be abandoned.

The most important factor in the handling of a shale well is the regulation of the line pressure against which the well is operating. Wells in some areas

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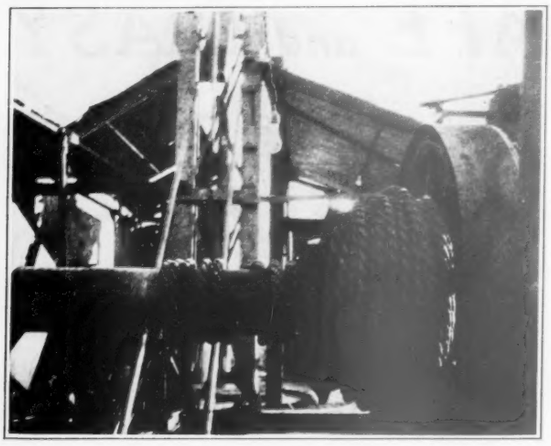

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seem to work best against a pressure of a few pounds, and those in others against a pressure of as much as 50 pounds. This is caused by (1) the depth which controls the initial pressure of the well, and (2) the open flow. Pressure alone will not lift the water—there must be enough volume to elevate it into the drip. A large well may be capable of lifting the water through 2-inch tubing, but some of the small wells will not lift it through 1-inch, and must be tubed with three-fourths-inch and possibly one-half-inch pipe.

The smaller the tubing the greater the lifting power of the gas passing through it, and for this reason even the large wells are equipped with 1-inch pipe upon completion, because eventually the volume and pressure will decline and this size will be necessary. Wells with an open flow of 50,000 cubic feet or more will ordinarily "clean themselves" when the 1-inch tubing has been run and the packer has set. They are then ready for the installation of the drip and line connections. Small wells, however, often require swabbing after being tubed, to remove the water which has accumulated in the bottom of the hole.

Well Starts Readily

It is ordinarily necessary to run the swab only once or twice to start the well. This swabbing can best be done while the drilling machine is still over the hole. If the well is put on the line immediately after the water has begun to come, it will not need additional attention for some time. However, if it is left to blow into the air, it may "go dead." A large shale well can generally be shut in without being damaged. The small wells, if shut in for only a few minutes, may become water-logged and require swabbing to start them. Accordingly, most operators never shut in their wells completely even when there is no market for the gas, but let them either blow open at full capacity or install pop-valves on the drips, which are set to open at whatever pressure is considered best for the well, ordinarily 15-50 pounds.

If several months are to elapse before the completed well can be connected with a pipe line, it should be shut in entirely and then swabbed when connections are ready, because, if left to blow open for a month or more, it may lose so much of its volume and pressure that it will be permanently damaged and never come back to its original state.

The average shale well is rather sensitive to variation in the line pressure against which it works. A well may be in excellent condition, putting out 50 per cent or more of its open flow against a line pressure of 40 pounds. If the pressure drops to 20 pounds, it would naturally be supposed that an increased delivery would result. In some wells this happens, but in others the delivery de creases. If the line pressure rises agai to 40 pounds the well may never put ou as high a per cent of its open flow a formerly.

Uniform Pressure Important

A well should be operated at a pressur as nearly uniform as possible. The ide working pressure is probably that which the well will deliver 40-50 per ce of its open flow. Delivering this amoun the well keeps an almost constant strea of gas and water rising into the drip. I only a small part of the volume is deli ered, only a small amount of water lifted, and the well may become wate logged. A well may also become wate logged from feeding against a very lo pressure, which lowers the working pre sure of the well to a point below that which it can raise the water.

Wells of 100,000 cubic feet volume re quire little attention, but those of onl 20,000-30,000 cubic feet—and there ar many of this size and smaller—may nee to be swabbed frequently.

Swabbing is commonly done with bailing rig mounted on a motor truck The bailing rig consists of a small gas oline engine on the bed of the truck, wire line and reel, a mast or tripod, an a 1-inch swab. Some operators use a automobile instead of a truck, and b means of a reel bolted to one of the rea wheels they utilize the automibile engin

An eastern Kansas cement plant. Plants such as this and brick plants, smelters, railroad shops and refineries, as well as cities, provide markets for shale gas.—Photograph by courtesy of Ash Grove Lime & Portland Cement Co., Kansas City, Mo.

for power. Another method is to use compressed air to force the water out of the well.

The ideal machine for reviving dead wells is a combination swabbing outfit and air compressor. The same engine that is used for swabbing operates a small air compressor also mounted on the truck. Where the air method works satisfactorily it is more desirable, as it is much quicker than swabbing.

To Blow a Well

To blow a well, the stuffing box is loosened, the drip disconnected, and by means of the tripod and block and tackle the 1-inch pipe is raised a few inches off its seat. The air line is then connected to the 2-inch through the tee, which is a part of the well equipment, and the stuffing box again tightened. Compressed air is admitted and forces the accumulated water out through the 1-inch tubing. It may be necessary to start the well several times before it will continue to function unassisted. For some unknown reason the air method does not always work satisfactorily and swabbing must be restored to. It is best for any producer who has many wells to have the combination machine.

Because of the construction of the automatic drips used on shale wells, an increase in the line pressure against which the well is equipped to work may cause the gas to escape from the lower end of

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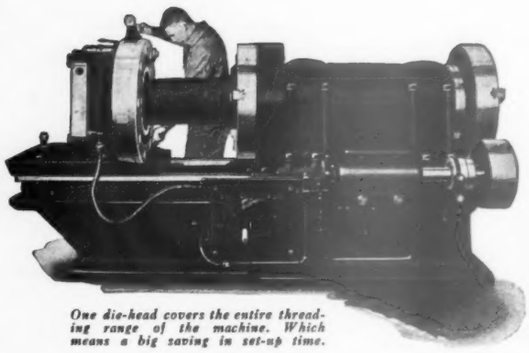

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the down-pipe. Under such a condition the down-pipe must be lengthened, thus submerging the lower end to a greater depth and sealing the drip against the higher pressure.

If the drill hole takes up all the salt water produced, there is no danger of the water doing damage to crops, but if the hole overflows, some provision must be made to carry the water away. A ditch is plowed to the nearest depression, or the water is directed into an earthen tank from which it can evaporate. If valuable farm lands surrounds the well, it may be necessary to pipe the salt water a considerable distance to such a tank or where natural drainage will carry it off. The principal danger of damage is in contamination of water wells. To avoid this, sufficient drive pipe should be set to case off the shallow water-bearing formations. Ordinarily two joints of 8-inch pipe are enough.

Production and Decline

Shale-gas wells have a wide variation in size and a corresponding variation in delivery of gas and revenue to the operator (Figure 4). In addition to the dry holes, some shale wells never pay out; a few have returned the complete investment in six months. Each well has a different history, controlled by volume, marketing conditions, pressures, equipment and experience of the producer in caring for it.

A shale well that comes in with a volume of 40,000 cubic feet would pay back its cost in approximately three and one-half years if its average delivery was 15,000 cubic feet per day throughout this period. This delivery allows for the natural decline of the well and the average of summer and winter operations and market conditions. In this estimate, consideration is made of a net return of 7 cents per 1,000 cubic feet to the operator, 6 per cent compounded interest on an investment of $1,200, and the value of the well equipment at the end of the period.

Partial records of three of the best wells of the Chanute Field are here given.

1. A well which tested 99,000 cubic feet open flow on March 1, 1928, and 79,000 on November 3, 1928, delivered 27,097,000 cubic feet during the year against 50 pounds line pressure. The net return to the operator was $1,896.79.

2. A well which had an open flow of 210,000 cubic feet on March 1, 1928, and 97,000 on November 19, 1928, produced 36,622,000 cubic feet, an average of 100,000 per day, and gave a return during the year of $2,563.54.

3. A well from which 37,976,000 cubic feet was sold in 1928 tested 314,000 on February 10 and 114,000 on November 15. The amount received by the operator during the year was $2,658.32.

Source of Gas

When consideration is given the possible reservoir space in 40 acres of the gas shale of average thickness, 12 feet, the question arises as to the source of all the gas produced by the largest wells. If the shale has a reservoir space of 10 per cent and the gas is confined under 250 pounds pressure, the equivalent of approximately 32,000,000 cubic feet would be present, calculated at 2 pounds above atmospheric pressure. The shales contain large quantities of salt water which would tend to lower their capacity for gas.

The largest wells produce as much at 35,000,000 cubic feet of gas the first year, and at the end of the year they may be delivering at the rate of 20,000,000 cubic feet per year and may produce 200,000,000 cubic feet in their active existence. The conclusion is forced, therefore, that gas is drained from an area much larger than 40 acres or it feeds in from other formations. If drainage takes place beyond the limits of the 40 acres, fracturing and jointing may be more important than is generally recognized.

Fracturing might be confined to zones of considerable length but sufficiently narrow to pass between wells of small volumes, thus explaining the presence of such in the vicinity of a large well supposedly tapping the fracture zone. An interlocking joint system might be feeding a well from a great area.

Some exceptional shale wells may have been drilled unknowingly into stray sand a few feet below the black shale. In as much as this sand locally contains gas ad additional amount of gas may be credited to the shale. It is certain, however, most of the very large wells produce from shale alone.

The chief asset of the shale wells is their slow decline in volume. No trustworthy estimate of the life of the wells can be made with the history of the industry so short. A few wells have been abandoned after a year or two, but most of them, ranging in age from two to seven years are still in operation. The small wells—those varying from 20,000 to 40,000 cubic feet—do not show much decline. Larger wells, testing from 100,000 to 300,000 feet when drilled in, may lose two-thirds of their open flow before the end of a year. The subsequent decline is much more gradual.

The production of the shale wells is subject to a natural decline similar to that of sand wells. The slow rate of decline can be attributed to the nature of the reservoir rock and the small tubing with which the wells are equipped. A sand-gas well would show a very gradual loss in volume if produced through 1-inch tubing.

The shale wells may be operated for 25 to 30 years. The economic life of such wells will be terminated when the cost of increased attention, due to small volume and low pressure and the cost of keeping the equipment in good condition, exceeds the revenue from the well.

Markets and Price

The gas industry of eastern Kansas is favored with good markets which include cities, cement plants, brick plants, smelters, condenseries, ice plants, and railroad shops. The cement plants are the largest consumers, some using 10,000,000 cubic feet daily.

Since shale-gas wells are so sensitive to change in line pressures, the producer should consider the type of market which the gas purchaser supplies, before signing a purchase contract. The ideal market is one which demands practically the same amount of gas day after day and 24 hours of the day. Such markets are the cement plants, brick plants, and smelters, which are in constant operation. City distributing plants alone are very unsatisfactory, as they use a large amount of gas during their peak loads in the day time and a comparatively small amount during the night, and the result is a wide range in line pressure in the gas field.

The price of the gas is 8 to 10 cents per 1,000 cubic feet at the well. If the well owner lays a line to the main line of the purchaser, he is paid 2 to 4 cents more per 1,000. Field measurements are made on a 2-pound pressure basis.

KENTUCKY-TENNESSEE

(Continued from Page 68)

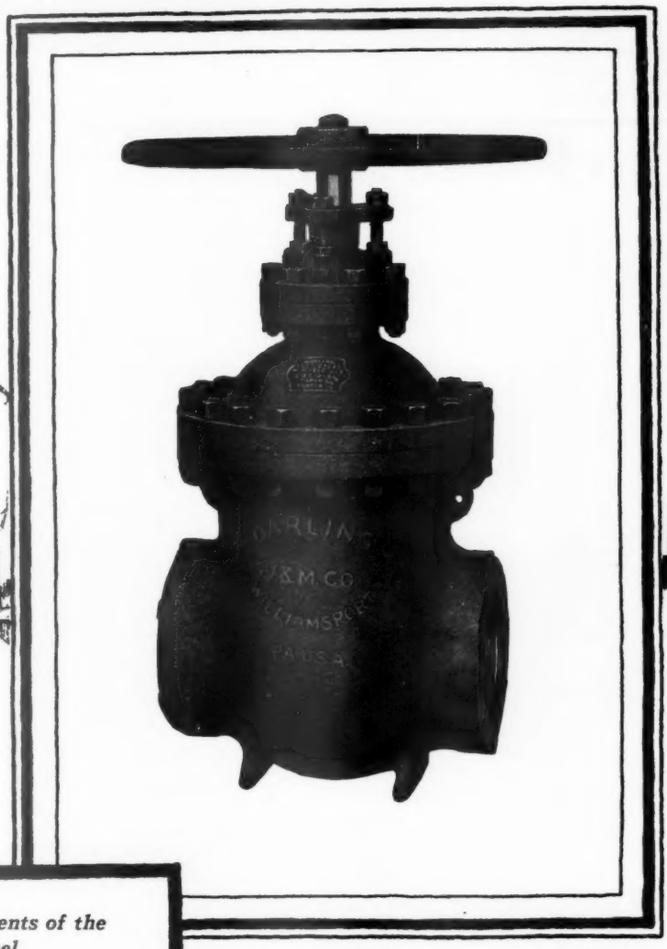
inal oil as it came from the early well.

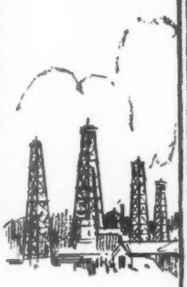
Many interesting stories have been written on crude oil and the discovery of the product in many parts of the United States. None of the stories give credit where it belongs. Crude oil was first discovered in drilling for salt in Ohio. Oil was discovered in the State as early as 1814, and probably as far back as 1812.

So far as can be learned, oil was first found in what is now Noble County, within 1 mile of Caldwell, the county seat. The first well was drilled by a Mr. Thorley in 1814 for salt, when oil was found at the depth of 185 feet. In 1816 Robert McKee began drilling there for salt water. Oil was found, and the product was given the name of Seneca Oil and was sold for medicinal purposes.

According to tradition the distinction of being the first man to drill expressly for oil in the United States is due to James Dutton. In the early 50's he drilled a well by the spring pole system for oil, about 1½ miles southeast of Macksburg. This well was a monster in those days, doing as high as 100 bbls. a day. The product was valued at $10 a barrel.

To Colonel Drake the greatest credit must be given, for when he found oil in 1859 on Oil Creek, in Pennsylvania, it meant a new industry.





Refinements of the Cast Steel Darling Valve.

Cast steel frame of great tensile strength; optional equipment of bronze or steel seat rings; forged steel or bronze-faced forged steel rotating discs; concealed seat rings, out of the way of tools and pipe; pipe and tool guides; chain-hook rings and tong lugs for easy installing and cast feet that keep valves in upright position when not in use.

What is an Ideal!

Great attainments—leadership in any activity—such things do not merely happen. There must be definite ambitions toward a clearly-visioned ideal. The *Ideal* then becomes the driving force of the individual or the organization—the pledge of unrelenting effort and maintained performance. An ideal is a task-master.

The ideal of the Darling Valve & Mfg. Company is leadership in the making of valves. The purchaser of a Darling Gate Valve—whether for producing, conveying or refining—is safeguarded by the existence of this active ideal.

DARLING VALVE & MFG. CO.
Williamsport, Pa.

New York Chicago Oklahoma City Houston

Mid-Continent Distributors:

Frick-Reid Supply Corp.
Atlas Supply Company
International Supply Company
Petroleum Supply Company
Happy Belting Company

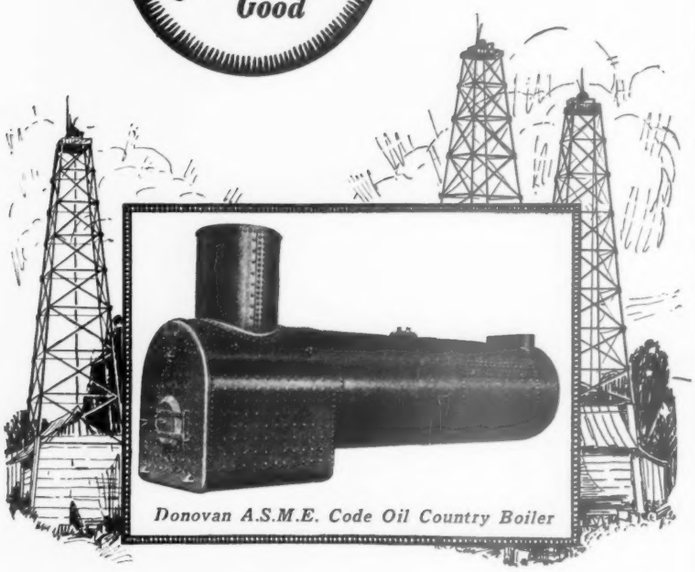
California Distributor:

Petroleum Equipment Company, Los Angeles

DARLING

GATE VALVES

Donovan Boilers are Consistently Good



Donovan A.S.M.E. Code Oil Country Boiler

On the Deepest Wells in the Mid-Continent

The fireman on a big rotary rig just finishing up around 6,100 feet recently spoke of his 115 H.P. 250-lb. DONOVAN Boilers in the following way:

"These are absolutely the finest boilers I have ever handled, and are by far the easiest steamers. I can carry consistently 10 to 15% higher steam pressure on the same kind of work on these boilers than I could on those of other makes of similar size and I can do it with less fire."

Thus, the latest DONOVAN was received by the trade. It has done what it was designed to do.

You cannot make any mistake in buying DONOVAN boilers and we invite comparison.

Manufactured by

DONOVAN BOILER WORKS, INC.

PARKERSBURG, W. VA.

NEW YORK OFFICE—30 Church Street
FRICK-REID SUPPLY CORPORATION
Mid-Continent and Eastern Distributors
GREAT NORTHERN TOOL & SUPPLY CO.
MIDLAND IRON WORKS
Montana Distributors

All Leading Supply Houses Throughout the Eastern Fields Handle

DONOVAN QUALITY PRODUCTS

NONE BETTER

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 46)

Howard Petroleum Co.'s No. 1 Gilbert, NW cor. SE Sec. 25-8-10 ..... Dry and abandoned 4,697 ft.
Gypsy Oil Co.'s No. 1 McGirt, NE cor. NW SW Sec. 21-6-8 ..... Sand 3,310-30 ft.; corrected, ha full water.

OKLAHOMA COUNTY

Slick & Bailey's No. 1 Koester, C SE NE Sec. 18-13-3w... Cleaning out 5,130 ft.
Cromwell & Franklin's No. 1 Thompson, SW cor. NE NE Sec. 15-12-3w ..... Fishing 7,183 ft.
Hall & Briscoe's No. 1 Holmes, NE cor. SW SE. Sec. 10-11-3w ..... Drlg. 4,366 ft.
Wall & McElroy's No. 1 Brady, NE cor. NE SW Sec. 6-11-2w ..... Rig.

OKFUSKEE COUNTY

Moose & Daniels' No. 1 Stidham, SW cor. NW Sec. 4-11-10 ..... Shut down 622 ft.
T. B. Slick, Inc.'s No. 1 Barry, SE cor. NE SE Sec . 21-11-7 ..... Drlg. 4,510 ft.
Erwin and others' No. 1 Patterson, NW cor. SE Sec. 15-13-9 ..... Location.
Erwin et al's No. 1 Patterson, NW cor. SE Sec. 15-13-9.. Location.
Prairie O. & G. Co.'s No. 1 Palmer, NW cor. NW NE Sec. 2-11-9 ..... Fishing 400 ft.

SEQUOYAH COUNTY

Cooper & Badger's No. 1 Young, NW cor. NE NE Sec. 7-12-20 ..... Shut down.
Hunt and others' No. 1 Unknown, SE cor. NW SW Sec. 12-12-23 ..... Shut down 1,105 ft.
Buffington et al's No. 1 Melcher, C SW NW Sec. 31-12-24 ..... Drlg. 2,700 ft.

PAWNEE COUNTY

Washoma Oil Co. and others' No. 1 Buffalo, SE cor. NE Sec. 33-22-5 ..... Shut down 3,200 ft.

POTTAWATOMIE COUNTY

Superior Oil Co.'s No. 1 Herminghausen, SW cor. NW NE Sec. 24-8-2 ..... Dry and abandoned 5,516 ft.
T. B. Slick's No. 1 Sailor, SE cor. NW NW Sec. 12-8-3... Drlg. 5,020 ft.
Mid-Continent Petroleum Corp.'s No. 1 James, SE cor. SE Sec. 22-5-3 ..... Rig.
Rush & Vaughn's No. 1 Lester, SE cor. NE NE Sec. 19-6-4 ..... Drlg. 2,420 ft.
Rush & Vaughn's No. 1 Lester, SE cor. NE NE Sec. 19-6-4 ..... Drlg. 3,475 ft.

CADDO COUNTY

J. B. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w... Shut down 150 ft.
W. J. Hartley's No. 1 Galbreath, SE cor. NW SE Sec. 29-5-12w ..... Shut down 3,394 ft.
English Drilling Co.'s No. 2 Pruitt, CNL NW SE Sec. 22-6-10w ..... Rigged up and shut down.

STEPHENS COUNTY

Stahl & Burris' No. 1 Jefferson, SE cor. NE Sec. 29-2-5w ..... Shut down 3,012 ft.
Prince Bros.' No. 1 Hidgecoxie, NW cor. NE Sec. 29-2-5w ..... Abandoned 2,119 ft.

SEMINOLE COUNTY

Phillips Pet. Co.'s No. 1 Miller, NW cor. SW Sec. 34-11-7 ..... Drlg. 4,535 ft.
Burke-Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW Sec. 13-9-7 ..... Drlg. 4,065 ft.
Gypsy Oil Co.'s No. 1 Andrews, NE SE NW Sec. 27-10-7 ..... Underreaming 4,275 ft.
McCulloch Oil Co.'s No. 1 McGilbray, SW cor. SW NE Sec. 4-8-8 ..... Drlg. 3,405 ft.
McCulloch Oil Co.'s No. 1 Powell, NW cor. NW, Sec. 11-6-5 ..... Rigging up rotary.
Mariand Oil Co.'s No. 1 Strothers, NW cor. SE NE Sec. 5-10-7 ..... Shut down 4,833 ft.
Magnolia Pet. Co.'s No. 1 Carroll, SW cor. NW SE Sec. 1-7-5 ..... Dry and abandoned 4,820 ft.
Magnolia Pet. Co.'s No. 1 Harjo, NE cor. SE Sec. 34-6-7.. Drlg. 2,000 ft.
T. B. Slick and others' No. 1 Davis, NE cor. NE Sec. 26-6-6 ..... Drlg. 4,250 ft.
McCulloch Oil Co.'s No. 1 Powell, NW cor. NW Sec. 11-6-5 ..... Rig.

OSAGE COUNTY

Superior Oil Corp.'s No. 1, NW cor. NE Sec. 30-29-8..... Shut down 1,310 ft.

MAJOR COUNTY

Randau & Mooney's No. 1 Parker, SE cor. NE NW Sec. 4-23-16w ..... Show oil 1,235 ft.; shut down.
Earl and others' No. 1 Turner, C NE NE Sec. 23-20-14w.. Rig.
Wilson et al's No. 1 Unknown, NE cor. NE Sec. 4-23-16w. Cellar.

WOODS COUNTY

E. K. Miller's No. 1 Copenhavers, NW cor. NW Sec. 18-24-13w ..... Rigged up and shut down.
Gypsy-Prairie and others' No. 1 Thompson, SE cor. SW Sec. 10-25-15w ..... Rigging cable tools 4,265 ft.
Sinclair Oil & Gas Co.'s No. 1 Thompson, C SW SW Sec. 33-27-16w ..... Rig and tools.

MURRAY COUNTY

Bison Oil Co.'s No. 1 Labor, NW cor. NW Sec. 17-1-2.... Drlg. 2,100 ft.
Ramsey Brothers' No. 1-A Malock, C SW NE Sec. 32-1-3. Dry and abandoned 1,344 ft.

DEWEY COUNTY

Huckaby & McCoy's No. 1 Perfect, NE cor. NE Sec. 9-18-15w ..... Shut down 4,500 ft.
Don Sifers' No. 1 Jordan, SW cor. NW Sec. 16-16-17w.. Spudded and shut down.

BECKHAM COUNTY

C. & H. Petroleum Co.'s No. 1 Barnes, SW cor. NW NE Sec. 32-9-22w ..... Shut down 3,460 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w..... Shut down 725 ft.
Producers Exploration Co.'s No. 1 Seidell, SE cor. SW SW Sec. 17-9-22w ..... Shut down 2,402 ft.
Trees Oil Co.'s No. 1 Rodgers, SW cor. SW Sec. 30-8-25w ..... Drlg. 100 ft.
Carson and others' No. 1 Danby, SW cor. SE NE Sec. 20-8-22w ..... Shut down 954 ft.
Pferffel and others' No. 1-A Carter, NE cor. NE Sec. 35-9-22w ..... Shut down 1,500 ft.
Day Oil Co.'s No. 1 Ault, NW cor. NW Sec. 33-8-21w.... Shut down 1,515 ft.; corrected.

GRADY COUNTY

Remington and others' No. 1 Fryrear, SW SW NE Sec. 13-9-5w ..... Dry and abandoned 720 ft.
J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w.... Spudded and shut down.
J. M. Henry and others' No. 1 Abraham, SE cor. NW Sec. 4-5-8w ..... Rig.
J. B. Nichols' No. 1 Brake, SE cor. NE SE Sec. 7-5-7w... Shut down 2,307 ft.

McINTOSH COUNTY

Marione and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 2,387 ft.; corrected.
Patterson and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 5,451 ft.
Wolfe et al's No. 1 Unknown, NW cor. SE Sec. 15-12-18.. Rig on ground.

CLEVELAND COUNTY

Daniels & LeWright's No. 1 Vandever, C SW Sec. 15-7-1w ..... Shut down 3,130 ft.
Phillips Pet. and T. B. Slick's No. 1 Hentleman, NE cor. NE Sec. 8-10-2w ..... Rigging standard tools 5,500 ft.

KIOWA COUNTY

Blue Mountain Oil Co.'s No. 1 Jones, SE cor. NW NW Sec. 17-5-14w ..... Shut down 530 ft.
C. B. Cloyes' No. 1 Brazill, SW cor. NE Sec. 34-7-17w... Shut down 950 ft.
Dave Malernee's No. 1 Van Kirk, NW cor. NW Sec. 35-7-15w ..... Shut down 858 ft. in granite.
A. C. Varner and others' No. 1 Bonham, CSL NW NW Sec. 5-6-18w ..... Shut down 1,137 ft.

Merrick Oil Co.'s No. 1 Kelly, NW cor. SE Sec. 20-7-17w..Drlg. 755 ft.
McWharter et al's No. 1 Sherwood, CWL NW NE Sec. 2-5-17w .....Drlg. 300 ft.

CUSTER COUNTY

W. E. Witt's No. 1 Wellman, C SE Sec. 1-14-14w.....Rig and tools.

PONTOTOC COUNTY

Moore & Curran's No. 1 Allen, SE cor. SW SW Sec. 23-5-5 .....Dry and abandoned 1,462 ft.
Denver P. & R. Co.'s No. 1 Roberts, SE cor. NE NE Sec. 36-5-4 .....Drlg. 1,890 ft.

COMANCHE COUNTY

Green and others' No. 1 Wilson, C NE SW Sec. 14-1-12w..Shut down 4,055 ft.
Wright et al's No. 1 Cross, NW cor. SW SW Sec. 4-1-9w..Rig.

COAL COUNTY

Indian Territory Illuminating Oil Co.'s No. 1 Cook, SW cor. NW Sec. 10-1-11 .....Drlg. 6,640 ft.
Robert Galbreath and others' No. 1 Jones, SW cor. SE Sec. 24-1-9 .....Fishing 3,350 ft.
J. S. Cosden's No. 1 Richardson, NW cor. NE NE Sec. 6-2-8 .....Rigging up.
McGinley & Sigler's No. 1 Willsey, NW cor. SE SE Sec. 7-2-8 .....Location.
E. W. Whitney's No. 1 Brown, C SE NE Sec. 10-2-8 ....Location.

PITTSBURG COUNTY

Kerr & Koy's No. 1 Hall, C NW NW Sec. 32-4-12 .....Drlg. 1,245 ft.
McCrow and others' No. 1 Trust, SW Sec. 12-1s-8e .....Dry and abandoned 1,923 ft.

JACKSON COUNTY

Altus Oil Co.'s No. 1 Northington, NE cor. NE Sec. 4-1-20w .....Shut down 2,020 ft.

SOUTHERN OKLAHOMA

BRYAN COUNTY

Alexander & Oppenheimer's No. 1 Hampton, SE cor. NE Sec. 26-7s-11 .....Shut down 1,425 ft.
McNull & Gross' No. 1 Smith, CEL SE NW NE Sec. 11-6s-9e .....Shut down 375 ft.
Lambert et al's No. 1 Mermann, CEL SE NE NE Sec. 27-6s-9 .....Drlg. 1,200 ft.
Yale Oil Syndicate's No. 1 Craige, C NW NE Sec. 36-9s-9e .....Drlg. 1,200 ft.

MARSHALL COUNTY

Moore et al's No. 1 McDuffy, SW cor. NE SW Sec. 3-7s-6 .....Drlg. 200 ft.
Sullivan and others' No. 1 Wines, NW NE NW Sec. 11-7s-5e .....Dry and abandoned 611 ft.

MURRAY COUNTY

Alter and others' No. 1 Johnson, SW cor. NW Sec. 14-4-7.Spudded and shut down.

COTTON COUNTY

Cuyler & Pyson's No. 1 Thomas, SE cor. SE SW Sec. 16-4-12w .....Dry and abandoned 2,127 ft.
Amerada Pet. Corp.'s No. 1 Dulaney, SE cor. NW NW Sec. 31-4-9w .....Drlg. 925 ft.
Pierce & Brown's No. 1 Hertzler, NW cor. NW Sec. 31-2-12w .....Shut down 2,452 ft.
Shasta Oil Co.'s No. 1 Pah-pe-chi, NE cor. NE Sec. 34-1s-11w .....Drlg. 2,100 ft.
Consolidated Oil Co.'s No. 1 Duvall, NW cor. NW Sec. 26-3-11w .....Drlg. 1,998 ft.

JEFFERSON COUNTY

Amerada Pet. Corp.'s No. 1 Emerson, NW cor. SE SW Sec. 28-5s-8w .....Shut down 4,516 ft

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6-19 .....Shut down 1,346 ft.

TILLMAN COUNTY

Bray and others' No. 1 Barker, NE cor. SW NW Sec. 9-1-15w .....Shut down 805 ft.
Dixie Oil Co.'s No. 1 McKinney, NE cor. NE Sec. 29-3s-18w .....Dry and abandoned 3,259 ft.
Stanley & McGregor's No. 1 Mock, NW cor. NW SW Sec. 33-1-20w .....Dry and abandoned 2,445 ft.
Landfair and others' No. 1 Smith, SE SW SE Sec. 6-2s-15w .....Shut down 2,535 ft.
Allen & Treadwell's No. 1 Howell, NW cor. SE Sec. 13-1-17w .....Shut down 625 ft.

ATOKA COUNTY

Wapanucka Oil Co.'s No. 1 Banks, Sec. 28-2s-9 .....Shut down 1,530 ft.

JOHNSON COUNTY

Smith & Knisely's No. 1 Lane, E half Sec. 29-1-7 .....Drlg. 1,600 ft.
Bush Creek Oil Co.'s No. 1 Kirby, SE cor. NE NW Sec. 9-4-7 .....Shut down for casing 405 ft.
E. J. Stump and others' No. 1 McGinnis, NW Sec. 26-3s-8w .....Drlg. 2,670 ft.

CARTER COUNTY

Devonian Oil Co.'s No. 1 Myer, NW cor. SE Sec. 19-5s-3w.Fishing 2,976 ft.
Avon-Dickey's No. 1 Anderson, NE cor. SE NE SE Sec. 32-4s-2 .....Drlg. 500 ft. corrected.
Schermerhorn Oil Co.'s No. 2 Jolliff, NE NW Sec. 24-5s-1e .....Fishing 4,536 ft.
Humble Oil & Ref. Co.'s No. 1 Hitchcock, SE NE Sec. 12-4s-3e .....Dry and abandoned 1,500 ft.
Humble Oil & Ref. Co.'s No. 1 Chapman, C SW NW NW Sec. 1-4-3 .....Rigging up rotary.

OKLAHOMA PANHANDLE

Magnolia Pet. Co.'s No. 1 School, C SE NE Sec. 22-5-5 ..Drlg. 1,260 ft.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 48)

Moncrief et al's No. 1 Johnson, SW cor. NE Sec. 9-13-19w .....Rig.
Caracas Group No. 1 Company's No. 1 Gestner, SE cor. SW NE Sec. 13-13-18w .....Shut down 1,750 ft., corrected.
Empire Oil & Ref. Co.'s No. 1 Wann, NE cor. NE Sec. 31-12-19w .....Dry and abandoned 3,985 ft.

EDWARDS COUNTY

Amerada & Wilcox's No. 1 Teansil, C NW SW Sec. 32-25-19w .....Drlg. 4,640 ft.
British American Oil Co.'s No. 1 McCarty, NE cor. NW Sec. 31-25-17w .....Drlg. 3,405 ft.

GEARY COUNTY

Wright et al's No. 1 Younker, NW cor. NE Sec. 17-11-5..Shut down 1,200 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w .....Shut down 2,450 ft.

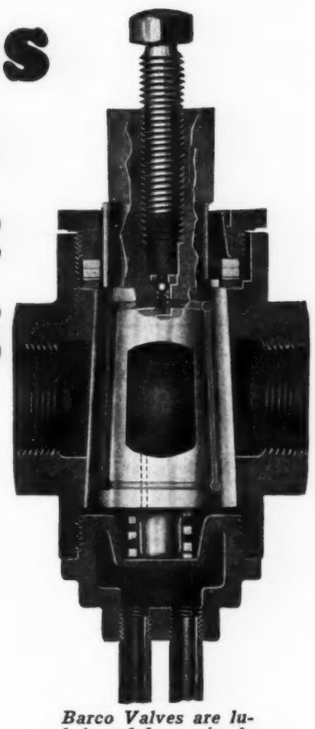
HARPER COUNTY

Amerada Pet. Corp.'s No. 1 Mendiville, C E SE Sec. 24-34-6w .....Plugging back to 4,330 ft.

HARVEY COUNTY

R. S. Austin's No. 1 Nieman, SW cor. SW Sec. 21-24-2...Dry and abandoned 3,448 ft.
R. F. Garland's No. 1 Cox, NE cor. NE Sec. 27-24-1w....Shut down 3,115 ft.
Empire G. & F. Co.'s No. 1 Tangeman, SW cor. NE NE Sec. 19-22-1e .....Drlg. 2,710 ft.
Mrs. Gay et al's No. 1 Grove, C NW NE NW Sec. 29-23-1w .....Shut down 2,100 ft.
Hartman & Skaer's No. 1 Seamen, NW cor. NE SE Sec. 26-24-1e .....Rig.
Heimerich & Payne's No. 1 Lindamond, C SW NE SW Sec. 2-22-1e .....Drlg. 2,250 ft.
Fisher & Louch et al's No. 1 Reiger, NW cor. NE Sec. 17-23-2 .....Drlg. 2,736 ft.
Colly & Ogg's No. 1 Randall, NE cor. NE Sec. 11-24-1w..Drlg. 2,370 ft.
Patton et al's No. 1 Duning, SE cor. SW NE Sec. 26-24-1..Spudded.
Rosenthal et al's No. 1 Ingalls, NW cor. SW Sec. 24-23-3w .....Rig.
Rosenthal et al's No. 1 Ingalls, C NW SW Sec. 24-23-3w..Drlg. 175 ft.
Colly & Ogg's No. 1 Hupp, SE cor. NE Sec. 22-23-1w ....Rig.

Residuums or Greases handled without clogging



The Barco Steam Jacketed Valve has been especially developed to handle residuums, greases and refined products that solidify on cooling. Clogging is effectively prevented by steam in the jacket at the end of the plug.

Barco Valves are lubricated by a simple arrangement which requires only a turn of the lubricating screw occasionally. They always work; never stick or leak.

Standard Barco Valves have also many other applications in refinery service. They are ideally suited for use on rundown and acid lines, loading racks, pump house manifolds and filter presses.

We'll be glad to send you our catalog number 310 describing Barco Valves, both regular and special, and their applications in the field and the refinery.

Write for it.

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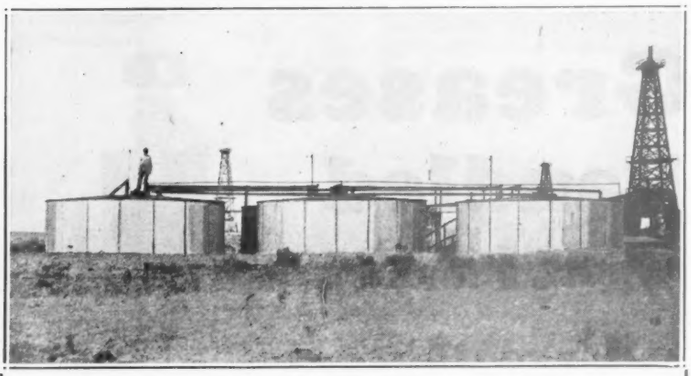
BARCO
Valves and Joints

O&GJ 3-28-Gray

KEYSTONE COPPER STEEL



Six 500-Bbl. Low Type Maloneys Used by White & Lane Oil Co. on Cockrell Ranch, Pampa, Texas

...all that the *best* tanks must be!

MALONEYS are *tight, durable, easily erected or taken down,* and *convenient to re-set*—thus fulfilling every requirement of the best bolted steel tanks possible to manufacture.

The following specifications explain MALONEY excellence: Rust-resisting Keystone Copper Steel material; patented "crimp" seams and joints, packed with our superior gasketing and dressed with our Gaso cement; all seams reinforced with heavy steel channels; bolts of 90,000 lbs. (instead of 60,000 lbs.) tensile strength; Maloney special pearl gray paint; large cleaning out plates set flush with bottoms; the best valves and thief hatches on the market.

"Alone in Quality"

MALONEY TANK MFG. COMPANY
Tulsa, Okla., U. S. A.

Distributers at All Principal Petroleum Points

Sizes: 12 to 10,000 Barrels

Packed in Steel-Bound Crates for Export

Howell Aluminum "4-in-1" Vacuum Pressure Valve and Thief Hatch —The BEST and LATEST Deck Equipment—POSITIVE Safety

MADE OF KEYSTONE COPPER STEEL

MALONEY PATENTED BOLTED COPPER-STEEL TANKS

MADE OF KEYSTONE COPPER STEEL

MALONEY ALONE!

MARSHALL COUNTY

Irwin et al's No. 1 Cooper, NE cor. NW Sec. 10-3-7 .....Shut down 600 ft.

MARION COUNTY

J. E. Hauna's No. 1 Pankratz, NE cor. NE SW Sec. 13-20-3 .....Rig.
A. E. Meyers' No. 1 Papp, SW cor. SW NE Sec. 10-18-2..Shut down 800 ft.
Frank L. Moore's No. 1 Miller, NE cor. NE Sec. 26-19-1..Rig.

McPHERSON COUNTY

Ted Washabaugh's No. 1 Vosshell, NE cor. NE Sec. 9-21-3w .....Drlg. 2,820 ft.
Larlaux et al's No. 1 Martinson, NE cor. Sec. 9-19-3w...Rig.
Vickers Pet. Co.'s No. 1 Wedell, C SW Sec. 12-20-2w....Rig.
Mid-Kansas Oil & Gas Co.'s No. 1 Yoder, C NW SW Sec. 8-20-4w .....Drlg. 3,200 ft.
Marland Prod. Co.'s No. 1 Wilkering, C SW SW Sec. 9-21-1w .....Drlg. 2,862 ft.

NESS COUNTY

Barnsdall Oil Co.'s No. 1 Lauk, C SW Sec. 35-18-21w.....Drlg. 3,092 ft.

OSBORNE COUNTY

S. D. Jarvis' No. 1 Jellison, SE cor. SE Sec. 13-10-15w...Drlg. 1,520 ft.

OTTAWA COUNTY

Anderson et al's No. 1 Bank, NE cor. NW Sec. 28-10-2w..Shut down 3,215 ft.

PAWNEE COUNTY

F. C. Troupe's No. 1 Lovett, CEL NE NE Sec. 31-21-16w.Shut down 1,560 ft.

PHILLIPS COUNTY

Watsonia Oil Co.'s No. 1 Marklein, NE cor. SW Sec. 21-3-19w .....Drlg. 3,897 ft.
British American Oil Co.'s No. 1 Weinman, C SW SW Sec. 34-2-19w .....Rig.

PRATT COUNTY

O'Haver & Jones' No. 1 Lunt, C SW NW Sec. 15-28-14w..Drlg. 300 ft.

RENO COUNTY

Austin Drilling Co.'s No. 1 Strickley, SW cor. NW Sec. 17-25-5w .....Rig.

RICE COUNTY

Allison & Fitzwilliams' No. 1 Poland, NE cor. SW NE Sec. 36-19-8w .....Cellar.
Higgins & Stembubble's No. 1 Shurr, NE cor. SW Sec. 21-20-10w .....Shut down 1,820 ft.

ROOKS COUNTY

Prairie Oil & Gas Co.'s No. 1 Sandberg, C SW Sec. 20-9-18w .....Shut down 1,600 ft.
Burford & Brimm's No. 1 Toxa, NE cor. SW SE Sec. 22-18-17w .....Spudded and shut down.

RUSH COUNTY

Phillips Pet. Co.'s No. 1 Legleiter, NE cor. NW SE Sec. 10-16-18w .....Drlg. 2,430 ft.
Sinclair Oil & Gas Co.'s No. 1 Berching, NW cor. NE NW Sec. 9-16-16w .....Underreaming 3,775 ft.
Danciger Oil Ref. Co.'s No. 1 Poland, NE cor. SW NE Sec. 17-19-17w .....Drlg. 1,010 ft.
Wilcox Oil & Gas Co.'s No. 1 Schwartzkopf, NE cor. NW SW Sec. 27-27-17w .....Rig.
Wilcox O. & G. Co.'s No. 1 Woodward, NE cor. NE Sec. 35-27-17w .....Rig.

SALINE COUNTY

M. Estey et al's No. 1 Peterson, C NE Sec. 6-16-5w.....Spudded and shut down.
Boyle et al's No. 1 Miller, SW cor. SE Sec. 21-16-1W....Shut down 2,615 ft.
Nathan Jones et al's No. 1 Robertson, NW cor. SW Sec. 27-14-2w .....Shut down 3,085 ft.

SEDGWICK COUNTY

Bu-Vi-Bar et al's No. 1 Roberts, SE cor. SW Sec. 1-26-2w .....Rig.
Lewis et al's No. 1 Taylor, NW cor. NE Sec. 23-27-2....Drlg. 2,418 ft.
J. H. Tatlock et al's No. 1 Goelder, NW cor. NE Sec. 6-29-2e .....Drlg. 3,532 ft.
Kyser et al's No. 1 Stroot, SW cor. NW Sec. 8-26-2w.....Drlg. 3,088 ft.
Lario & Blair's No. 1 Tjaden, C NE SE Sec. 22-29-2w....Drlg. 2,340 ft.
R. Maglason et al's No. 1 Buckles, NW cor. SE Sec. 3-28-1w .....Shut down 250 ft.
Magnolia Pet. Co.'s No. 1 Wise NW cor. NW Sec. 36-28-2w .....Drlg. 2,360 ft.
McCulloch Oil Co.'s No. 1 John, C NE SW NE Sec. 24-29-1e .....Shut down 3,559 ft.
Washabaugh et al's No. 1 Harrison, NW cor. NE NE Sec. 3-26-2w .....Drlg. 400 ft.
Morgan & Tilley's No. 1 Fitzgerald, NW cor. NE Sec. 5-26-1w .....Drlg. 1,720 ft.
Barnsdall Oil Co.'s No. 1 Faber, SW cor. NW Sec. 6-27-1w .....Drlg. 3,792 ft.
Connell & Slick's No. 1 Cross, NE cor. NE Sec. 27-25-1w.Plugging back to 2,730 ft.
Miller Wentz' No. 1 Shaffer, NW cor. NE Sec. 9-27-2w .....Drlg. 1,600 ft.
Kroder et al's No. 1 Harden, SW cor. NW SW Sec. 20-26-1e .....Spudded.
Morgan et al's No. 1 Corn, SW cor. NE. Sec. 28-26-1w....Shut down 2,980 ft.
E. B. Shawver et al's No. 1 Reeves, SE cor. SW SE Sec. 19-28-1e .....Drlg. 3,130 ft.
Shell Pet. Corp.'s No. 1 Lygrisse, SE cor. NE Sec. 15-26-2e .....Drlg. 2,730 ft.
Washabaugh et al's No. 1 Lowery, NW cor. NE NE Sec. 3-26-2w .....Rig.
Sullivan et al's No. 1 Shelly, NW cor. NE SE Sec. 32-29-2e .....Drlg. 500 ft.
Hartman & Skaer et al's No. 1 Hutchinson, SE cor. SE SW Sec. 23-28-3w .....Drlg. 920 ft.
J. H. Tatlock's No. 1 Cook, SW cor. SW Sec. 25-28-3...Fishing 765 ft.
Producers Oil Co.'s No. 1 Jones, SW cor. NE SE Sec. 31-26-2 .....Rig.
Connell & Slick's No. 1 Mohammah, NE cor. SE SE Sec. 3-25-1w .....Rig.
G. L. Ramsey's No. 1 Schluesser, SW cor. SW Sec. 1-25-1 .....Drlg. 2,748 ft.
Jones & Kirk's No. 1 Sheppard, SE cor. NE Sec. 4-25-1...Spudded.
H. H. Patton's No. 1 Ryder, NE cor. NE Sec. 22-25-1....Underreaming 3,043 ft.
Sullivan et al's No. 1 Shelly, C NW NE SE Sec. 32-29-2e .....Drlg. 500 feet.
LaFont et al's No. 1 Carlton, C SE SE SW Sec. 24-28-1e..Rig on ground.
T. B. Slick's No. 1 Rosenhagen, C SW SE NE Sec. 33-27-4w .....Rig.
Frank Wahn's No. 1 Wilson, C NE NW SE Sec. 9-26-1w..Rig.
Patten & Wentz' No. 1 Swanson, NW cor. NE Sec. 6-26-2e.Drlg. 512 ft.
E. B. Hawkins's No. 1 Murfit, C SW Sec. 4-25-2w .....Spudded.
Connell & Slick's No. 1 Mohannah, C NE SE SE Sec. 3-25-1w .....Drlg. 325 ft.
Reynolds & Rogers' No. 1 Updegraft, C SE SW SE Sec. 26-25-1w .....Rig.
Jones & Kirk's No. 1 Sheppard, SE cor. NE Sec. 4-25-1e..Drlg. 779 ft.

SHERMAN COUNTY

A. L. Henson et al's No. 1 Murry, NE cor. SE NW Sec. 22-7-40w .....Shut down 3,035 ft.

STEVENS COUNTY

Trees Oil Co.'s No. 1 Thompson, C NE SW Sec. 3-35-28w..Drlg. 820 ft.
W. Sidwell et al's No. 1 Kelly, SW cor. NE Sec. 16-34-38w .....Shut down 1,710 ft.

SMITH COUNTY

Mid-Kansas Oil & Gas Co.'s No. 1 Unknown, NE cor. NE Sec. 4-2-13w .....Drlg. 2,416 ft.

SUMNER COUNTY

McCullough Oil Co.'s No. 1 Teetle, SW cor. NE Sec. 29-34-1w .....Shut down 4,632 ft.
Gypsy Oil Co.'s No. 1 Williams, NW SE SW Sec. 16-35-3w .....Fishing 4,400 ft.
Davidson and others' No. 1 Strickland, SW cor. SE Sec. 12-35-7w .....Rig.

TREGO COUNTY

Central Commercial Oil Co.'s No. 1 Ellis, NE cor. SW NE Sec. 20-13-21w .....Shut down 3,300 ft.

WASHINGTON COUNTY

McCool & Vincent's No. 1 Linn, NW cor. NE Sec. 27-4-3..Rig.

GULF COAST

(Continued from Page 54)

No. 1 Tarbutton is in a shale showing oil at a total depth of 5,136 feet and has cemented casing to test. Mills Bennett Production Co.'s No. 1 Smith, discovery well of that flank, is setting 3-inch screen inside the 4-inch, total depth being unchanged at 5,272 feet. The latter's No. 2 Smith is drilling shale at 2,039 feet and its No. 2 Kirby is in lime rock at 5,148 feet. Bennett's No. 1 Means is drilling shale and sand at 4,898 feet, and a location has been made for another deep test, No. 1 Hamman-Armstrong. Humphreys Corp. has rigs up for two more deep tests, Nos. 6-A Kirby and No. 1 Tarbutton. No. 6-B Kirby still is fishing. Eunice & Carpenter also have a rig up for a deep test, No. 1 Feldman. This offsets Humphreys Corp.'s Cornelia Barber tract. Rexall Petroleum Co. (Mike Kouri) is rigging up to pump No. 1 Shaw. The latter was started for a deep test but found a shallow sand at a total depth of 2,066 feet. The derrick, which was up for No. 2, was blown down in a windstorm late in the week.

Mills Bennett Production Co.'s No. 1 Barber on the north side of the dome is drilling gumbo at 1,619 feet.

Humble—Harris County

South Texas Petroleum Co.'s No. 3 Morris, south edge deep test, is flowing 230 bbls. of oil with the screen blown 45 feet up in the casing. Efforts will be made early in the week to pull the screen and reset to test the sand at a total depth of 4,831 feet. The Texas Company's No. 39 Stevenson, offset to the Morris tract on which three deep producers have been completed, has been trying to blow out from sand at 4,436 feet but if the gas can be killed successfully the hole will be deepened to the depths of the Morris wells. Humble Oil & Refining Co.'s No. 1 Williams to the west of the Morris tract is drilling gumbo at 562 feet. The Texas Company's No. 22 House on the north side of the field is drilling sand and shale at 4,536 feet.

Raccoon Bend—Austin County

Twelve tests were drilling and two others were rigged up at Raccoon Bend late in the week. All are being drilled jointly by the Humble Oil & Refining Co. and Valley Oil Corp., which companies hold the entire acreage. No. 3 Urban is drilling sticky shale at 2,900 feet. No. 8 Urban is waiting on casing cement to set at 1,180 feet. No. 1-D Grawunder has run 13⅜-inch surface casing at 1,282 feet. No. 2 Dietrich is drilling hard, sandy shale at 2,735 feet. No. 1 Sherrill is in shale at 3,171 feet. No. 3 Thompson is waiting cement to to set at 1,233 feet. No. 2 Kearns is drilling hard shale at 3,335 feet. No. 2 Saunders is in sand and boulders at 1,150 feet. No. 1 Buchanan has set surface casing at 234 feet, and No. 1 Mueller at 213 feet. No. 1 Wilson heirs is drilling shale and lime at 687 feet. Nos. 2-A Washington and No. 4 Wilson are rigged up. No. 3 Wilson was abandoned in hard sand at 1,079 feet.

DeWalt—Fort Bend County

Humble Oil & Refining Co.'s No. 5 Sugarland was expected in at the close of the week. It had drilled plug at 3,585 feet and was coring deeper to find the sand. No. 6 Sugarland is drilling gumbo and lime at 2,514 feet. A location also has been made for No. 67 Sugarland to offset to the west the company's No. 2 Camp, recently completed. No. 3 Camp is rigged up. No. 2 Nelson is drilling sand and boulders at 1,457 feet. No. 2 Brazos Farms is drilling sandy shale at 3,286 feet, No. 3 is reaming at 3,206 feet, No. 4 is drilling sticky shale and lime at 2,056 feet and No. 5 is in gumbo at 1,221 feet. No. 1-A Bankers Mortgage is drilling hard shale at 2,945 feet.

Boling-Fort Bend and Wharton

The only development at Boling was the placing of Vacuum Oil Co.'s No. 1 Taylor, south side of the dome, on the pump for approximately 150 bbls. daily from sand at 2,920-42 feet. On the east side of the dome, South Texas Petroleum Co.'s No. 1 Fotjeck-Hyde has been deepened to 4,078 feet and screen has been reset. The Texas Company's No. 1-B Dipple drilled 6⅝-inch plug at 3,711 feet but at a total depth of 3,731 feet failed to get a showing and is drilling deeper. The latter's No. 1 Pleasants is drilling gumbo and boulders at 1,867 feet, and its No. 2 E. C. Farmer is drilling sand at 3,548 feet. Sun Oil Co.'s No. 2 Rogers is standing after bailing salt water at 4,159 feet. Scott & Peck's No. 1 Armstrong is drilling lime and shale at 4,810 feet.

Clay Creek—Washington

Sun Oil Co.'s No. 2 Witt late in the week picked up the pay sand at a depth of 935 feet and has cemented 6⅝-inch casing to test. No. 2 J. Grote also has a showing of oil in black shale at 2,450 feet but so far showings that deep have not turned out favorably. Sun Oil Co.'s No. 2 Schirmer is drilling water sand at 1,158 feet and No. 1 Schlottman is drilling sticky shale at 920 feet. No. 4 G. F. Grote is a derrick and No. 7 a location.

Liberty—Liberty County

In the recently opened shallow sand pool, Navarro Oil Co.'s No. 2 Baldwin Community is drilling sticky shale and sand at 1,013 feet. No. 3 Baldwin Community is rigged up. Vacuum Oil Co.'s No. 11 Barrett is drilling gumbo at 693 feet. Liberty Oil & Sulpher Co.'s No. 1 Monroe is rigged up and Gulf Production Co. has a location for No. 1 Monroe. Humble Oil & Refining Co.'s No. 3-B Reviere is drilling gumbo at 650 feet and its No. 4-B Reviere has spudded. Fort Bend Oil Co.'s No. 2 Reviere is drilling gumbo at 881 feet and the latter's No. 3 has spudded. Abercrombie & Harrison also have a location for No. 1 on their Reviere lease.

In the other shallow sand pool to the north, Sun Oil Co.'s No. 41 Mitchell is drilling sand at 1,580 feet, and in the Turner well district to the north of that Empire Gas & Fuel Co.'s No. 2 Groggan is drilling gumbo at 725 feet.

Sun Oil Co.'s No. 40 Mitchell, deep sand test on the east flank, is drilling gumbo at 2,289 feet and Yount Lee Oil Co.'s No. 16 Mitchell is drilling lime at 2,125 feet.

On the northwest side of the dome Vacuum Oil Co.'s No. 1 Trinity, which failed to flow from an oil sand at 3,531 feet, is waiting on a pumping rig. The Texas Company's No. 3 Pickett is drilling hard sand at 4,351 feet, and its No. 5 Green is in gumbo at 536 feet.

Blue Ridge—Fort Bend County

Humphreys Corp.'s No. 5 West-Schenck on the south side of the dome was running tubing late in the week in an effort to make it flow. It has been swabbing to test a showing in heaving shale at 4,171-81 feet, bottom of the hole being at 4,190 feet. Moody Corp.'s No. 6 West-Schenck, same area, which tested salt water at 4,389 feet is to be deepened.

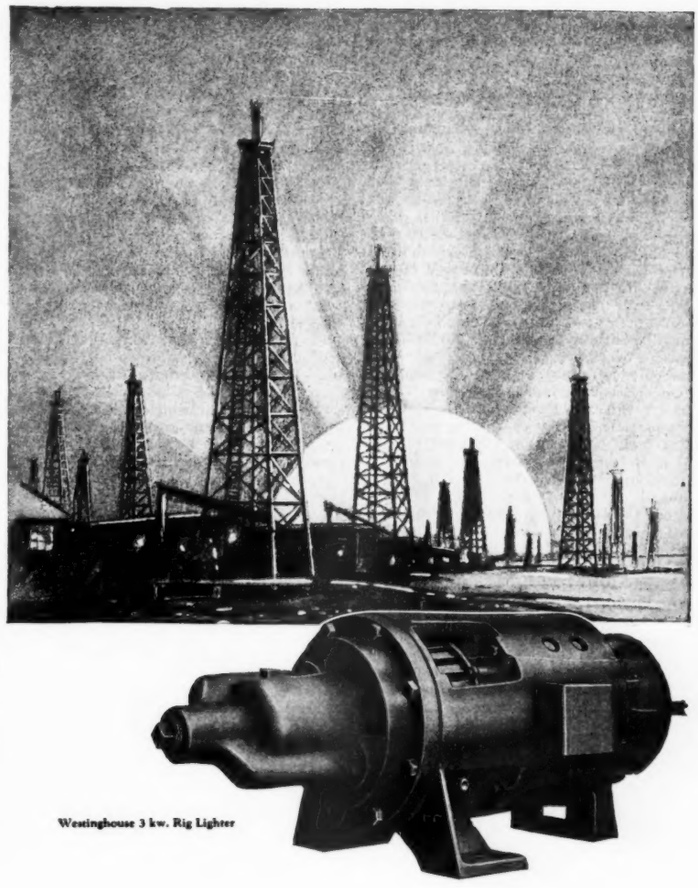
Navarro Oil Co.'s No. 6-B Robinson, northwest side, is drilling shale and lime at 3,060 feet and Telshaw and associates' No. 2 Blakely, which has been standing at 2,715 feet, is drilling out the back pressure valve. Blakely & Means' No. 2 Blakely is drilling gumbo at 3,240 feet.

On the east, Gulf Production Co.'s No. 7 Invincible is drilling sand and shale at 3,184 feet. No. 17 Blakely is drilling gumbo at 2,662 feet and No. 15 Luscher is rigging up. South Texas Petroleum Co.'s No. 1 Blakely is drilling at 3,770 feet.

Pierce Junction—Harris County

Of particular interest at Pierce Junction is the starting of a test by the South Texas Petroleum Co. on its Meyers tract on the extreme south side of the dome which, if successful, will complete the production circle of the Pierce Junction Dome. Production has been developed along the east, northeast, north, northwest, west and recently has been opened on the southwest flank but extending from the latter around the south flank to the east side remains a long gap. As compartively few tests have been drilled anywhere on the south, the Meyers test is in virtually virgin territory. A rig is up for the test.

On the southwest flank, where production recently was opened by Moody Corp's No. 4-B Settegast, Pure Oil Co.'s offset to the north, No. 1 Herman Estate, is drilling hard sand at 1,228 feet, and Gulf Production Co.'s offset to the east, No. 29 Taylor, is rigging up. The manner



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in which the Moody well is holding up and at times increases its flow is creating more interest in the possibilities of linking the various flank pools. Production on the west flank is expected to be extended southward and a step nearer the Moody well by Reese Wolfe's No. 1 Herman Estate it has casing cemented at 3,600 feet to test a showing at a total depth of 3,623 feet. The latter offsets to the south, Rio Bravo's Oil Co.'s Settegast tracts on the west flank. The latter company's No. 12-A Settegast is drilling gumbo and sticky shale at 3,416 feet and No. 13-A Settegast on the south edge of the lease, which the Wolfe well is offsetting, is drilling gumbo and shale at 1,900 feet. This test originally went to below 4,093 feet but lost the hole and had to sidetrack. Rio Bravo's No. 7-B Settegast, a work-over, is drilling gumbo and lime in sidetracked hole at 927 feet.

On the east side of the dome, T. G. Shaw and Texas Exploration Co.'s No. 2 Fitzsimmons-Barrow is drilling shale at 4,384 feet. Navarro Oil Co. and Humble Oil & Refining Co.'s joint No. 2 Dooley is drilling lime and shale at 3,515 feet. Navarro Oil Co. and Texas Exploration Co.'s No. 14 Dooley is drilling deeper in a sandy shale showing oil at 4,570 feet. The latter joint operators' No. 4 Dooley, which bailed dry at 3,959 feet early in the week, is to be deepened. Gulf Production Co.'s No. 8 Taylor is drilling hard shale at 3,086 feet and No. 8 Cain is spudding. This company's No. 2 Fitzsimmons-Hamman, which blew in several weeks ago with a heavy gas pressure at 4,522 feet, and which has been shut in, is trying to crater.

Anderson & Plummer's No. 5 Whitehead, north side of the dome, is drilling hard sand at 3,456 feet and Moody Corp.'s No. 4-B Whitehead is drilling sand and shale at 4,283 feet.

Nash Dome—Fort Bend and Brazoria

Rycade Oil Corp.'s No. 23 Wisdom, a former well being deepened, is drilling hard, sandy lime at 4,329 feet. Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 1 Wisdom (joint test), which tested salt water at 5,602 feet, has been abandoned.

Spindletop—Jefferson County

Spindletop was one of the Gulf Coast fields which was swept by strong wind storm late in the week which leveled 24 derricks. However, the damage was confined to producing wells and abandoned wells and not to drilling operations. Yount Lee Oil Co.'s No. 5 Davis, a work-over, tested salt water Friday at 3,987 feet. This company's No. 29 McFaddin is trying to sidetrack hole at approximately 3,700 feet after drilling to approximately 4,600 feet. No. 94 McFaddin is drilling shale at 4,633 feet; No. 96 is waiting cement to set at 2,927 feet; No. 97 is in shale at about the same depth; No. 98 is drilling gumbo and lime at 2,354 feet; and No. 99 is in shale and lime at 2,512 feet. No. 6 Fee is drilling shale at 2,978 feet.

On the Gladys City leases, Yount Lee Oil Co.'s No. 74 is in sand and shale at 4,026 feet; No. 76 is in shale and lime at 5,156 feet; No. 83 is waiting cement to set at 3,052 feet; No. 84 is in shale and lime at 2,827 feet, and No. 85 is in sand and shale at 1,979 feet.

Big Creek—Fort Bend County

Navarro Oil Co.'s No. 3 Davis, is drilling lime rock at 1,300 feet. The Texas Company has rigged up for No. 5 Wheat following the abandonment of No. 4. Gulf Production Co.'s No. 52 Davis is drilling gumbo and boulders at 2,861 feet. No. 31 Davis, a work-over, is drilling at approximately 3,420 feet.

Saratoga—Hardin County

Rio Bravo Oil Co.'s No. 106 B.B.B. &C. has drilled into salt at 2,853 feet and probably will be abandoned. West Production Co.'s No. 1 Baker is drilling tough gumbo at 2,249 feet. E. W. Skinner's No. 2 Sissler, the only other test, is drilling below 2,217 feet.

Goose Creek—Harris County

Humble Oil & Refining Co.'s No. 75 Simms-Smith, deep wildcat test north of the field, drilled to 3,802 feet but has sidetracked and is drilling at 2,336 feet in gumbo. Gulf Production Co.'s No. 25 Ashell Smith is drilling at 2,698 feet. The latter's No. 15 Beaumont, a work-over, is rigging up to pump. Russell Farrell's No. 5 Gillette is drilling below 1,923 feet.

SOUTH LOUISIANA

Lockport—Calcasieu Parish

Vacuum Oil Co. and Gulf Refining Co.'s No. 1 Henshaw-LeMoin is in a water sand at 5,843 feet and probably will be abandoned at that depth. No. 13 Miller, a work-over, is sidetracking in sand and hard streaks at 3,862 feet. No. 24 Miller is drilling hard, sandy lime at 1,922 feet and No. 4-A Farquahar is drilling gumbo at 5,680 feet. No. 5 Bayou-D'Inde is drilling sandy shale at 1,838 feet. No. 6 Bordages, completed last April as a small producer at 3,675 feet, at 3,645 feet is rigging up to deepen.

Shell Petroleum Corp.'s No. 1 Miller is drilling blue, sandy shale at 3,047 feet.

Jennings—Acadia Parish

E. F. Simms has abandoned No. 1 Syndicate-Clemont which has been standing for some time at 3,871 feet. Jennings Petroleum Co.'s No. 2 Eunice Crowley, which tested salt water at 4,209 feet, is pulling screen. E. L. Meyers is rigging up to deepen No. 1 Clemont Zigler. It was a former small pumper at 1,805 feet. Yount Lee Oil Co.'s No. 6 Housierre-Latrielle is drilling shale and sand at 6,575 feet. The latter's No. 4 Crowley is drilling shale and lime at 5,560 feet.

Bayou Bouillon—St. Martin Parish

Rycade Oil Corp.'s No. 6 Bouillon fee is drilling sand and shale showing oil at 3,127 feet. No. 7 Bouillon is rigging up. No. 8 Bouillon fee is drilling hard, sandy lime at 3,727 feet and No. 3 Louisiana State has reset 13⅜-inch casing at 1,094 feet.

Miscellaneous Fields

At Markham, Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 6-A Kountze is drilling hard lime and shale at 2,772 feet. West Production Co.'s No. 1 Myers, Markham, is drilling rock at 1,775 feet. Gulf Production Co.'s No. 18 Moore, Orchard, is drilling hard sand at 3,744 feet. Sun Oil Co. is rigging up for No. 2 Kovelcik at North Dayton. No. 1 was abandoned several weeks ago in cap rock. Yount Lee Oil Co.'s No. 4 Louisiana Petroleum Co., Anse La Butte, is in a sand and shale at 4,225 feet. Gulf Refining Co.'s No. 11 United Land Co., Sorrento deep test, is drilling below 3,312 feet. Pure Oil Co.'s No. 7 Yount Lee Oil Co., Sweet Lake, is cleaning hole to deepen from 4,594 feet. No. 8 Yount Lee is drilling sand and shale showing some gas and salt water at 4,784 feet.

MISCELLANEOUS WILDCATS

Texas

Brazoria County—Humphreys Corp's No. 1 Bryan, Bryan Mound, is drilling sandy lime at 2,285 feet.

Calhoun County—B. F. Thompson's No. 1 Thomas, 10 miles west of Port Lavaca, has drill stem stuck in gumbo at 2,730 feet.

Fort Bend County—West and associates' No. 1 Hartfield, Needville, is drilling sandy shale showing some gas at 6,478 feet. Gulf Production Co.'s No. 11 Trone, Long Point, is drilling sandy lime at 734 feet.

Galveston County—Republic Production Co.'s No. 1 Lobit, Dickinson, is drilling hard sand at 4,725 feet.

Harris County—Humble Oil & Refining Co.'s No. 1 Minnetex, Mykawa, is drilling shale at 5,811 feet. The latter's No. 5 Warren at Hockley is drilling shale and lime at 3,254 feet. Baldwin and associates' No. 1 Kitzman, Cypress, is drilling gumbo at 3,600 feet. Little York Oil Co.'s No. 1 Davis at Little York is drilling gumbo at 2,810 feet.

Jackson County—The Texas Company's No. 1 Moore, north of Edna in the D.&G.N survey No. 311, is drilling sandstone at 3,429 feet. Other operations in the county are standing.

Jefferson County—Gulf Production Co.'s No. 6 Bordages Fannette, is in sand and shale at 5,420 feet. No. 7 Bordages is drilling gumbo at 2,510 feet and No. 11 Thomas is in rock at 2,740 feet. Shell Petroleum Corp. is building a derrick for No. 1 Heisig in the T.&N.O. survey No. 86. Vacuum Oil Co. is building a road to its wildcat location, No. 1 Herbert-Broussard, T.&N.O. survey. The Texas Company's No. 1 Pipkin, Big Hill, is drilling sand and shale at 5,050 feet. Yount Lee Oil Co.'s No. 1 Nona Mills, Hillebrandts Survey, is drilling shale and sand at 4,102 feet.

Liberty County—Humble Oil & Refining Co.'s No. 4 Sterling, Moss Bluff, is drilling gumbo and lime at 1,792 feet. Republic Production Co. has a rig up for No. 1 Myslivac, north of Hardin. The Texas Company's No. 2 Davis, Davis Hill, is drilling sandy shale at 3,377 feet. Union Exploration Co.'s No. 2 Esperson, Sheeks, which tested salt water at 3,944 feet, is drilling deeper at 4,084 feet.

Matagorda County—Crossland and associates' No. 1 Hawkins, Shepherds Mott, is drilling shale at 3,904 feet. Griffith and associates' No. 1 Culver, Citrus Grove, is standing in lime and gumbo at 1,997 feet.

Orange County—The Texas Company's No. 1 Kuhn is drilling gumbo at 1,693 feet.

Waller County—The Texas Company's No. 1 Young, Young Ranch, prospect, is drilling hard sand at 1,137 feet.

SOUTH LOUISIANA

Ascension Parish—Gulf Refining Co.'s No. 1 Belle Helene, Darrow Dome, is drilling sandy shale with no showing at 2,327 feet. This company's No. 11 United Land Co., Sorrento Dome, is drilling at 3,312 feet. Triumph Oil Corp.'s No. 2 Lacey, southeast of the town of Sorrento, is standing at 2,106 feet.

Cameron Parish — Shell Petroleum Corp.'s No. 6 Watkins, Black Bayou, is drilling blue shale and lime at 3,940 feet. A location has been made for No. 9 but further work on that will be delayed pending dredging of a canal to the location. The Texas Company is moving derrick material for No. 3-A Calcasieu Lake, Calcasieu Lake Dome.

Iberia Parish—Gulf Refining Co.'s No. 3 Kling, Loreauville, is drilling hard sand and pyrites at 3,618 feet. No. 1 Moresi is drilling pyrites at 2,769 feet. A derrick is up for No. 9-Z state. Jefferson Lake Oil Co. has abandoned its No. 1 Lake Peigneur, Jefferson Island Dome. The Texas Company's No. 3-A Vermillion Bay is milling at 4,325 feet.

Iberville Parish—Shell Petroleum Corp. is still trying to straighten up casing in No. 3 Wilbert, White Castle. Total depth is 3,847 feet. Union Sulphur Co. has abandoned No. 3 Schwing, Bayou Des Glaise, in salt at 3,701 feet. Standard Oil Co.'s No. 1 Schwing Bayou Blue, is standing at 3,648 feet. No. 2 Schwing is waiting a derrick. Piling for a derrick is being driven for No. 3 and a canal is being dredged to the location for Nos. 4 and 5. This company also has a rig up for No. 2 Wilbert and is dredging a canal to the location for No. 3.

Jefferson Davis—Vacuum Oil Co.'s No. 1 DeVilbiss, Roanoke, is drilling water sand at 5,356 feet. This company's No. 1 Earle is drilling gumbo at 4,763 feet.

LaFourche Parish—Union Sulphur Co. has abandoned Nos. 1 and 2, Dilbert and associates at Thibodaux, the former at 1,301 feet and the latter in salt at 1,772 feet. Gulf Refining Co. also has abandoned its No. 9 Stark, same dome, in cap at 1,408 feet. The latter is drilling gravel at 350 feet in No. 10 and Union Sulphur Co. is spudding No. 3 Dilbert and associates.

Miscellaneous Parishes—Gulf Refining Co.'s No. 1 Morris & Rose, Spanish Pass, Plaquemine Parish, is standing rigged up. The Texas Company's No. 1 Gurdan Island Bay, Plaquemine Parish, is waiting a rig, a derrick having been completed, Southern Gas Co.'s No. 1 Peoples, Houma, Terrebonne Parish, has been abandoned in rock at 2,284 feet. The Texas Company's No. 1 Botney Bay, Point Barre, St. Landry Parish, is pulling screen to deepen after testing salt water at 3,799 feet. U. S. Mineral Development Co.'s No. 1 Reynaul, St. Landry, is fishing drill stem at 1,720 feet. Elbof Exploration Co.'s No. 1 Smith, St. Landry Parish, is drilling gumbo and boulders at 1,600 feet. Ohio Oil Co.'s No. 3 Martin, Hagar Dome, St. Martin Parish, is standing with 4½-inch casing cemented at 4,480 feet. The Texas Company's No. 1 Fee, same dome, is rigged up. Other active operations include The Texas Company's Nos. 1-A Timbolier Bay, 1-B Lake Pelto, Lake Barre, 1-B Bay Coon Road, 1-B Four Isle Bayou and 1-A Dog Lake Bayou, Terrebonne Parish, all of which either are moving in derrick material or driving piling for derricks.

SOUTHWEST WILDCATS

(Continued from Page 52)

will move north and drill another test. No. 1 reached a total depth of 3,125 feet and is now fixing to make a test at 2,290 feet, where it had a showing of oil.

Brooks County

Mi'ham Drilling Co.'s (American Maracaibo) No. 1 Riley Allen, (location last week in error) is location 8,416 feet west line, 14,722 feet north line of San Antonio grant.

Duval County

National Oil Co.'s No. 2 Ball, Block 5, is using magnetometer to check location. O. Henry Oil Co.'s No. 1 Henry, Block 1,879, located 450 feet southeast lines, 220 feet northeast lines, is drilling at 2,200 feet. W. F. Morgan's No. 1 Welder-Woods, Survey 102, located 2,725 feet east line, 75 feet south line, is standing at 1,740 feet waiting on water.

Starr County

U. S. Oil & Gas Co.'s No. 1 Kelsey, Porcion 76, Block 11, located 1,500 feet north line, 500 feet west line, is drilling at 400 feet. The Texas Company's No. 1 V. C. de Guerra, Porcion 68, Block 92, located 600 feet east line, 6,280 feet south line, jurisdiction of Mier is rigging up.

Webb County

G. S. Lumpkin's No. 1 H. Yeager, Porcion 33-34-35, Block 17, is location 1,170 feet east line, 150 feet south line. L. W. Nelson's No. 1 Moglia, Survey 672, located 150 feet east line, 2,584 feet south line, has spudded in. Usher Carson's No. 2 D. Benavides, Survey 1,613, Block 11, located 150 feet north and west lines, has spudded in.

Zapata County

National Oil Co.'s No. 1 Don B. Adams, Section 11, Block 4, is ready to spud in. John Pappas' No. 1 Cuellar, Porcion 33-34, Block 5, located 333 feet northeast line, 193 feet southeast lines, is drilling at 510 feet.

Atascosa County

Amphion Oil Co.'s No. 1 Sam Schlisser, Farm B, 300 feet northeast lines, 600 feet southeast lines, is drilling at 125 feet.

Bexar County

Allen Burnam's No. 1 Ward, southwest of Martinez, is shut down at 1,620 feet, 212 feet in Edwards. J. J. Curl's No. 1 Frank P. Carle, Section 5, 1,320 feet east line, 660 feet south line, is drilling at 251 feet. Humble Oil & Refining Co.'s No. 2 Oppenheimer, J. M. Urriegas Survey, 300 feet north of No. 1, is drilling at 3,268 feet probably in Glenrose. Indian Creek Oil & Gas Co.'s No. 1 Wolfsohl, J. A. Navarro Survey No. 5, located 180 feet CEL, is resuming drilling at 540 feet with two crews. Moore-Jauer's No. 1 Holly R. Ellison, T. York Survey, 2,916 feet east line, 1,500 feet south line, has set and cemented casing at 383 feet.

Caldwell County

Russell's No. 1 Hill, McCullough Survey, is standing at 547 feet. M. O. Rayor's No. 1 D. C. Robinett, M. G. Duke Survey, 150 feet northeast and southwest lines, is drilling at 1,500 feet. Whittington and others' No. 1 J. G. Horner, Francis Berry Survey, is at 1,140 feet in hard streak in shale, connecting up with new boilers.

Calhoun County

B. F. Thompson's No. 1 Thomas, John P. Tully Survey, 910 varas north, 5 minutes 30 seconds west of north corner of John C. Post Survey, is cleaning out at 2,390 feet.

Edwards County

A. M. Griffith's No. 1 Wardlaw, Section 60, Block V8, located 1,050 feet west line, 150 feet south line, is drilling at 1,260 feet.

Fayette County

Marshall & Moore Oil Co.'s No. 1 John A. Kerr, M. Muldoon League No. 5, located about 250 varas to north line and

ttle west of center, is standing at 2,-78 feet. National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams League No. 1, cated 300 feet north and east lines, at 713 feet has been drilling in thin bro-en formations of 2 to 3-foot in thick-ess for the last 200 to 300 feet. R. E. halon's No. 1 Cervenka, Fayette Coun-School Lands, is drilling at 3,700 et in series of rock, lime rock and umbo.

Goliad County

J. E. Alexander's No. 1 Frommie, 10 iles north of Goliad, is in lime at 716 et. Booth McCarson's No. 1 Murray, rvey 3, Block 11, located 200 feet west e, 150 feet south line, is drilling at 230 feet.

Gonzales County

Joe Bruner's No. 1 Miller, Richard eath Survey, 3,040 feet north line, 200 et east line, is drilling at 400 feet. rown Petroleum Co.'s No. 1 Hattenbach, mes Jones Survey, 900 feet east line, 0 feet south line, is moving in rig. . D. Flynn's No. 1 Wilhausen, S. Bate-an Survey, east central part, is fish-g at 5,212 feet.

Guadalupe County

Pat Armstrong's No. 1 Halm, Wake-ld Survey, is straightening out titles preparing to spud in. J. J. Christie's o. 1 Taylor Thomas, Gustavus Chot-ell Survey, 1,100 feet southwest lines, 30 feet southeast lines, at 1,224 feet top of Edwards shows oil and has en delayed by heavy rains. G. A. reene's No. 1 B. B. Dix, Ira Nash Sur-y, 610 feet north of road, 320 feet st line, is standing at 665 feet. Gray-rg Oil Co.'s No. 1 Sophie Haensel is cation. Magnolia Petroleum Co.'s No. F. A. Whitley, Samuel Highsmith Sur-y, 300 feet CNL, is drilling at 530 feet. iller Brothers' No. 1 Gib Springs, E. rtari Survey, 450 feet west line, 775 et south line, is drilling at 2,309 feet. ugene Sights' No. 1 C. Woehler, John ng Survey, 310 feet north line, 210 et east line, at 2,130 feet cored George-wn with strong gas odor. Simms Oil .'s No. 2 Jandt is location south and st of No. 1. Shell Petroleum Corp.'s o. 2 Charles Grein is moving in 500 et southwest of No. 1. The Texas Com-ny's No. 1 Lambrecht has spudded in miles southeast of Shell's tests. Trinity illers' No. 1 Baptist Landmark Asso-ation, in townsite of Kingsbury, is illing at 1,975 feet in chalk topped 1,-3 feet.

Jackson County

The Texas Company's No. 1 W. C. oore, I.&G.N. Survey No. 208, located 08 feet south line, 150 feet west line, drilling at 3,335 feet. Wright Broth-' No. 2 Classen, 1,500 feet north 10 grees west of No. 1, is standing at 3,-5 feet; No. 8 Drushell has derrick up.

Karnes County

H. E. Hewitt's No. 1 W. E. Porter, miles south of Runge, is drilling.

Kerr County

McMan Oil & Gas Co.'s No. 2 Walter hriener is location.

Kinney County

Lloyd Oil Co.'s No. 1 G. Bedell Moore tate, Survey 117, S. A. Maverick, 1,320 et to CNL, at 1,000 feet is shut down th hole full of water from 300 feet. ardon Oil Co.'s No. 1 Jim Clamp, Sur-y 346, Section 1,492 at 2,540 feet is illing; Edwards topped at 2,493 feet, owed some gas and set casing too low d are pulling casing to reset.

Lavaca County

The Texas Company's No. 1 Russek, Martin Survey, 150 feet south and st lines, is drilling at 3,330 feet.

Maverick County

Ryan Consolidated Petroleum Co.'s No. Indio is standing at 1,320 feet. Rycade l Corp.'s No. 4 J. M. Chittim, Section 4, Block 7, is drilling at 400 feet; o. 3 Chittim, Section 116, Block 7, 3,007 feet is deepening, salt water nding in hole; No. 4 Sullivan, Sec-n 112, Block 7, has derrick up.

Medina County

W. M. Allison's No. 1 Haeglin, Sur-y 579, located 300 feet CNL, is shut wn at 600 feet. California-Medina's . 1 Rothe, Survey 1,012, at 3,278 feet erecting 112-foot derrick and moving big rotary rig to deepen. F. M. Cline's No. 1 Bendele, Survey 593, located 600 feet west line, 150 feet south line, is standing at 815 feet showing some oil. Donaldson Oil Development Co.'s No. 1 Adams Co., Survey 25, located 160 feet east line, 1,227 feet south line, is drilling at 3,015 feet in Edwards and will go back and set casing at about 2,000 feet to test showing at 2,290 feet. Lynch and others' No. 1 Mott at 580 feet is setting pipe to cut off water. Thomas-Ryan's No. 1 Conger, Survey 459, located 200 feet north and east lines, at 1,046 feet total depth, set casing, at 1,008 feet tested dry.

McMullen County

Natt Holman's No. 1 Shiner, Henry M. Brewer Survey, 7,515 feet south of Nueces River, 3,084 feet east line of survey, is drilling at 780 feet.

Nueces County

Southern Crude Oil Purchasing Co.'s No. 1 Roy Clift, Section 197, is drilling at 2,515 feet. Pearson and others' No. 1 Bluntzer, Block 3, NW cor., is drilling at 1,600 feet. R. & G. Corp.'s No. 1 Roberts is location several miles north of Agua Dulce Field; No. 1 Ragland has set surface casing at 450 feet. Nueces River Basin Development Co.'s No. 1 Allen, G. Farrier Survey, has resumed drilling at 2,936 feet.

Refugio County

Blanco Creek Oil Co.'s No. 1 St. John, J. Scott Survey, 708 feet northwest lines, 3,074 feet northeast lines, at 2,550 feet total depth, cored sand 2,450 feet showing trace of oil and gas. Magnolia Petroleum Co.'s No. 1 Glenewinkle, J. Scott Survey, 330 feet south and east lines, is coring at 4,222 feet. Mission Drilling Co.'s No. 1 Mitchell, at south end of Oak Street in city of Refugio, is coring at 3,310 feet.

San Patricio County

J. T. Laprade's No. 1 D. Odem, Herron Survey, 1,400 feet west line, 1,458 feet east line, has set surface casing. George B. Pickett's No. 1 Whitworth, NW NW, Section 60, is standing at 3,-250 feet.

Uvalde County

Pure Oil Co.'s No. 2 J. D. Smythe, Survey 687, located 1,920 feet south and 265 feet east of No. 1, is drilling at 2,264 feet.

Val Verde County

Producers Oil Co.'s No. 1 Everett, Section 40, is shut down at 2,115 feet in sand. Independent Operator's No. 1 Whitehead, SE SE, Section 30, Block 4, is standing at 4,800 feet. O. O. Owens and others' No. 1 Mills, Section 128, is shut down at 4,210 feet. Dyar Brothers' No. 1 Wilson, Section 115, is shut down at 2,720 feet. Valvert Oil Corp.'s No. 1 Bassett, Section 47, is at 3,600 feet in sandy shale fishing for pipe.

Victoria County

Humble Oil & Refining Co. is drilling on a deep test, location and name of well to be announced next week.

CANADIAN FIELDS

(Continued from Page 56)

clear of water and mud a production test will be made.

Royalite Oil Co.'s No. 14, LSD 4, Section 7-20-2w5, is drilling in the lime at 3,474 feet. Royalite's No. 12, LSD 3, Section 13-20-3w5, is drilling at 3,673 feet. Royalite's No. 15 is at 3,474 feet and setting an 8¼-inch liner.

Royalite's No. 18, LSD 15, Section 12-20-3w5, which got production in the deep lime at 3,826 feet, on a 10-day test average 201 bbls. Royalite Oil Co.'s No. 19, LSD 5, Section 6-20-2w5, is drilling at 4,075 feet. Royalite's No. 20, LSD 7, Section 12-20-3w5, is drilling at 3,052 feet. Royalite's No. 21 is drilling at 2,-695 feet. Royalite's No. 23, NW, Section 31-19-2w5, is drilling at 240 feet.

Home Oil Co. has acquired 160 acres to the east of its present holdings in the south end of the Turner Valley Field from United Oils, Ltd., which increases the Home holdings to 360 acres. It is reported Imperial Oil, Ltd., has agreed to include this additional acreage in its drilling contract with the Home Oil Co. The royalties in Section 20-19-2w5 include one-eighth royalty on a total of eight wells when drilled in LSDs 3, 6, 12 and

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13, and one-fifth royalty on a total of five wells when drilled in LSDs 1, 8, 9, 11, 14 and 16.

United Oils' No. 4, LSD 2, Section 24-20-3w5, is fishing for tools lost in the hole at around 5,370 feet when the derrick burned. The light crude flows are apparently increasing, and run as high as 100 bbls. in a day. Analysis of samples showing gasoline, 70 per cent; kerosene, 15 per cent; gas oil, 6 per cent; fuel oil, 6 per cent; loss, 3 per cent.

South End of Field

In the south end of the field, East Crest Oil Co.'s No. 1, LSD 5-6, Section 16-19-2w5, has recovered tools and resumed drilling in the lower Fernies at 3,500 feet with a 12½-inch hole. The test is being carried to the deep lime, after encountering gas in three horizons in the Dakota and Homes sand and the Fernie shales, and oil in two stray sands between the Home and Dalhousie sands. The location is about 1¼ miles southeast of Home's No. 1, and on the eastern crest of the Turner Valley anticline. East Crest's No. 2 has cellar dug on a location 860 feet south of No. 1. East Crest Oil Co. has secured 1,600 acres on the Cypress Hills structure, and may drill a test there. An advisory board has been named to handle field operations for the East Crest company, comprising W. S. Fenderson, F. R. Webster, H. S. Price, A. Hess and M. H. Staples.

Outwest Petroleum Co., Ltd., is working on derrick and camp for its test on the New Black Diamond structure, west of the main Turner Valley structure. Angus Oils, Ltd., LSD 5, Section 3-21-4w5, about a mile west of the Outwest location, is hauling equipment and will spud in this spring.

Merland Oil Co. of Vancouver, British Columbia, with an aggregate of 4,500 acres in Alberta, including some acreage in the Turner Valley, is planning to drill a series of six test in the latter field, No. 1 to start early this spring.

Miller, Court & Co. of Montreal have purchased a controlling interest in Hargal Oils, Ltd. of Vancouver, British Columbia. It is understood that, in addition to one test in Wainwright Field, four tests will be drilled on Turner Valley acreage. Oak Oils, Ltd., of Calgary is planning a test this spring on its Turner Valley acreage.

Vulcan Oils, Ltd., has arranged to finance additional work, and will undertake cleaning out of its No. 1 well, LSD 13, Section 11-20-3w5. No. 1 had about 100 bbls. production from the deep lime at 5,004 feet, but has been frozen off. After No. 1 has been cleaned out, Vulcan's No. 2, same LSD, which is standing at 4,906 feet, will be carried to the production horizon in the deep lime.

Mercury Oils' No. 1, Section 4-19-2w5, in the south end of the Turner Valley Field, has spudded in with a standard outfit. The company holds some 280 acres in W half, Section 4-19-2w5, partly belonging to the former holdings of Dutch-American Oils. Ltd., and partly secured from Mills City Oils, Ltd. The location is about 200 feet from the old Record Oil Co. deep test, abandoned after getting some shows of light crude.

Moose Mountain

In the Moose Mountain district, Signal Hill Oil Co.'s No. 2, LSD 9, Section 34-23-5w5, is drilling at 2,568 feet, with slight shows of oil persisting. In the same area, Maccabee Creek Oils, Ltd., is preparing to drill on acreage secured by Dr. W. A. Lincoln from Alberta Foothills Development Co., Ltd., in Sections 32 and 33 and part of 29, in Township 23-5w5, and a derrick is up and camp erected in the NE cor. of Section 33, a mile northwest of Signal Hill's No. 2 and on the same structure. Drilling will start in the Benton shales with chances of production between 2,700 and 3,000 feet. Directors of Maccabee Creek Oils, Ltd., include Arthur Baldwin, E. P. Stephenson and W. Austin Brown, all of Calgary.

On the Morley Reserve, Melbourne Oils is resuming drilling at 2,000 feet after the winter shutdown. This is a diamond drill test. Production is thought possible around 3,000 feet, with some prospects of crude in the Benton shales.

In the south extension of the Turner Valley Field, Sterling-Pacific Oil Co. No. 1, LSD 15, Section 33-18-2w5, is reported working on derrick for a test spud in next month. The company owns all of Section 33 and LSDs 6 and 16 Section 34, the property being south the Mill Creek holdings and near the extreme end of the Turner Valley. Vancouver capital is largely financing the company.

In the Waite Valley, Richfield Petroleum's No. 1, Section 35-20-4w5, is reported working on derrick for a cable tool test. The first gas horizon is looked for around 1,200 feet. Calendonia Co. has secured 400 acres on the same structure, with option on 240 acres additional, and is planning to spud this spring. In the Rickert area west of the Turner Valley Paramount Oils has a test rigged up, LSD 2, Section 28-19-4w5. In addition to 3,100 acres on this structure the company has 200 acres due east the Waite Valley structure, 81 acres Rice Creek west of Nanton, and 20 acres in the Moose Mountain district.

In Death Valley, west of the Waite Valley structure, Norcon Oil Co.'s No. is rigging up for a diamond drill test.

In the Aldersyde district, south of Calgary, Ranchmen's Gas & Oil Co., LSD 16, Section 13-20-29w4, is drilling around 2,950 feet with traces of oil and gas reported. High River Oilfields, LSD Section 34-18-29w4, is working on camp and hauling equipment for a test on the High River structure.

Skiff Field

In the Skiff Field, southern Alberta, Imperial-Devenish's No. 3 is drilling at 2,990 feet, after passing the market with a small oil flow, and is thought to be about 80 feet from the oil sand found in Devenish's No. 1 at 3,060 feet. The water shutoff at 3,947 feet has been passed by the government engineer.

In the Border areas, Madison Oils' No. 1 on the Beaver Dome, LSD 10, Section 24-2-11w4, is drilling around 1,000 feet with a little additional gas reported.

Shareholders of Ko-Top Oils, Ltd., held their first annual meeting at Calgary recently, when directors were re-elected. Location was made last year in SE Section 2-1-17w4 on the Red Coulee structure west of Coutts, expected to spud this spring.

Hudson's Bay-Marland Oil Co.

Announcement has been made by G. M. Ruby, vice president and western manager of the Hudson's Bay-Marland Oil Co., that his company will spend around $250,000 this season on its drilling program, mainly in the eastern and southern portions of Alberta. A location has been made in Section 23-17-18, 20 miles south of Bassano, where a test will be drilled to 4,000 feet if necessary at an estimated cost of $100,000; the contract has been awarded and materials being moved. The test is primarily for gas to be sold to a pipe line company which proposes to supply Moose Jaw and Regina. Material is being moved in for a joint test well to be drilled in conjunction with the Alberta Gas & Fuel Co., a Henry L. Doherty subsidiary, about 6 miles north of Champion, in Section 16-23w4. Here it is proposed to drill 4,800 feet if necessary for oil, at a cost around $100,000. On April 1 the Hudson's Bay-Marland company will start a test in the Viking gas field, to be drilled for gas to the Viking sand at a cost of around $35,000, Northwestern Utilities Ltd., taking the production. Six other drills are also at work in southern and eastern Alberta securing structural data.

In the Wainwright Field, east-central Alberta, Wainwell Oils' No. 2, LSD Section 36-44-7w4, is apparently increasing its gas production and has to be blown frequently. Some of the gas is being used for the Wainwell refinery and for drilling and camp purposes. Wainwell's No. 4 will be started about 500 yards northeast of No. 2. It is reported that Wainwright-Dome Oils, Ltd., and Anwood Oil Co. have pooled their resources and will drill a joint test 2 miles south of Wainwright. Derrick is now being erected and a rotary outfit will be used. This test is in a new pool of the Wainwright Field.

1

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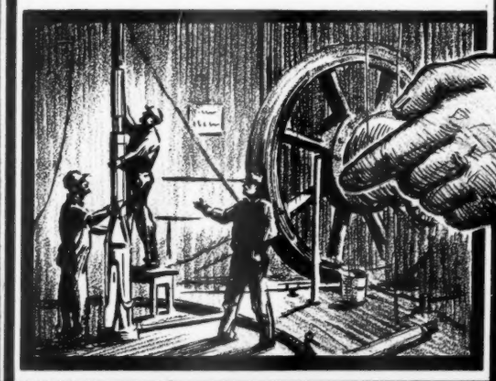

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GAS ENRICHMENT WITH SYNTHETIC HYDROCARBON

The Pittsburgh Experiment Station of the Bureau of Mines is making a study of gas enrichers. This study is of particular interest to the natural gasoline industry which has made some progress in the fractionation of gases suitable for the enrichment of artificial gas.

Factors involved in the enrichment of gas by the use of synthetic hydrocarbons are discussed in the Bureau of Mines Serial 2840, the Department of Commerce has just announced. This paper may be obtained upon application to the Bureau of Mines. A definite set of conditions must prevail before it is economical to enrich gas in this manner, according to the announcement, which follows in full text:

"In recent years numerous investigators throughout the world have given attention to the possibilities of producing hydrocarbon compounds from a gas which can be made readily from coal or coke, namely, from water gas, the Department points out. It has been so completely demonstrated, on a laboratory scale, that these compounds can be thus synthesized that a brief study was made at the Pittsburgh Experiment Station of the Bureau of Mines of some of the important factors governing the development and utilization of such a process in connection with gas works operation.

"Some of the factors limiting the production of synthetic hydrocarbons for gas-enriching purposes have been discussed in Bureau of Mines Serial 2840. It appears that there is a definite set of conditions which must prevail before it is economical to enrich gas in this manner.

"Using catalysts thus far found to be suitable, it is necessary to clean the water gas to an unusually high state of purity because of the poisoning effect of sulphur compounds upon the catalyst; a process has not yet been developed for this purpose. Furthermore, the design of a reaction chamber satisfactory for large-scale operation is still a problem, largely because of the large amount of heat evolved during the process. Because of these and other similar conditions, the exact cost of enriching gas with synthetic hydrocarbons made at the gas works is not known.

"However, it is evident that even under very favorable conditions it will not become generally economical until gas oil is 9 to 10 cents a gallon, and perhaps not until it is very much higher than this. The whole matter of gas enrichment by the use of synthetic hydrocarbons produced at the gas works is now under consideration by committees of the American Gas Association."

KETTLEMAN HILLS SHIPMENTS

LOS ANGELES, Calif., Mar. 23.—Shipments of natural gasoline are now being made from the new plant of The Texas Company of California located in the Kettleman Hills Field of California. The Texas Company plant is the first to be built in that field.

The gasoline is being moved by pipe line to the Ora station a distance of 8 miles. The plant is now handling approximately 36,000,000 feet of gas daily with an output of 40,000 gallons.

THREE-DAY MEETING

The program committee of the Natural Gasoline Association of America is completing the program for the annual meeting of the association which will be held at Tulsa, May 21, 22 and 23. The committee has decided that three days will be required for the meeting instead of two as previously announced.

GROWTH OF GASOLINE INDUSTRY REFLECTED IN TESTING METHODS

By H. J. Hunter*
Columbian Gasoline Corp.

When we consider the rapid development of the natural gasoline industry we do not wonder that the methods of testing too must change, especially when we remember the adage "That no industry is more efficient than its method of testing."

In order to more clearly transmit an idea of the rapid development the following are approximate figures for daily production in gallons at the first of the year mentioned:

1911	22,000
1917	750,000
1923	2,300,000
1929	5,300,000

In other words, almost as much natural gasoline is produced in one day now as was produced during the entire year of 1910. Little is known of the quality of the natural gasoline produced prior to the year 1918 except that it was always referred to as "wild gasoline."

The first tests made on gasoline were of a more complicated nature than those methods in use at present. The specific gravity of course was very important and distillations were made using various types of apparatus vapor, tension tests were made using all kinds of equipment with varying results. Therefore the results of a test were of little value to the refiner, the result was that he had little use for natural gasoline of any kind.

The United States Bureau of Mines was largely instrumental in creating a set of standard methods of testing; also in developing specifications for the product, based upon the tests. About the year 1918 the A.S.T.M. method of distillation was adopted for all gasoline. Several years later this method was revised and the A.S.T.M. method for natural gasoline adopted.

The present I.C.C. method of making vapor tension tests was adopted at about the same time and until recently has seen little change, especially regarding shipping rules. Several methods have been tried in an effort to supplant the old method which is generally conceded to be very unreliable. Among those are the Beistle Prather and the Reid methods. The latter is generally conceded as being the most reliable at present.

Discontinued Tests

There are a number of tests that have been almost entirely discontinued as being of no value of determining the quality of the product and are rarely used. Among these are acid heat test, unsaturated hydrocarbons, iodine number, etc. The color test is also becoming obsolete except with those refiners who are blending with cracked gasoline that is slightly off color and want water white natural gasoline in order to make the finished product colorless.

We have discussed the tests made in the past to more clearly define the progress that has been made, as that is the only way in which we can measure this progress and assist us in planning for the future.

Future Tests

The present methods of testing are all well standardized and are very valuable to both the gasoline plant operator and the refiner but even then there is still much to be desired. The distillation test is the most common and when made according to the specifications adopted by the American Society of Testing Materials and the Natural Gasoline Association, is a fair indicator of the volatility of the gasoline. The gravity determination is also valuable when accompanied by the distillation test, but is not of much value in determining the quality of a gasoline unless the distillation range is known. The doctor test is satisfactory for all practical purposes, as also is the corrosion test. The present method of measuring the vapor tension is not so satisfactory, as all kinds of results are obtained, by different operators, and a great deal of controversy and dispute has resulted concerning the vapor tension of natural gasoline shipments.

There has been considerable research work done in an effort to develop a means and method of measuring vapor pressure that would be adaptable to the natural gasoline industry. When all results of different methods are summed up, there has been little if any improvement made over the old I.C.C. or Bureau of Explosive method in so far as shipping is concerned.

Measuring Vapor Pressure

The following is a brief discussion of the various methods developed so far:

Beistle Prather Method: The bomb consists of a closed metal cylinder with a pressure gauge at the top and a gauge glass on the side. A small pipe is put inside the bomb reaching to near the bottom of the bomb with a valve at the top near the gauge. The cylinder holds 500 c.c. with the gauge glass calibrated at 100 and 300 c.c. levels leaving vapor spaces of 200 and 400 c.c., respectively.

The test is made by filling the bomb full of gasoline and heating to 100 degrees in a water bath, venting to the upper mark and reading then to the lower mark and reading again, waiting each time until the pressure on the gauge becomes stationary. The vapor pressure is then calculated by subtracting the first pressure from twice the second.

Reid Method: The Reid bomb is made in two parts. The upper part, called the air container, has a capacity of four times the lower or gasoline container. The air container has a connection for a pressure gauge on the top of a one-quarter-inch pipe connection on the bottom. The gasoline container has a connection in the top to be screwed into the bottom of the air chamber.

The test is made by purging the air chamber with air at room temperature. The gasoline chamber is filled with the gasoline to be tested. The two are connected and the bomb is immersed in water at 100 degrees Fahrenheit and shaken until the pressure becomes constant when

(Continued on Page 138)

*Plant Foremen's Meeting.

A PRACTICAL SUGGESTION

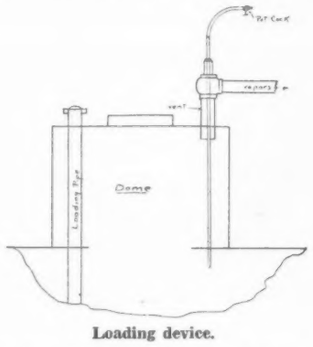
A LOADING DEVICE

Excessive loading losses can practically always be lessened by loading the tank cars under pressure. This is often accomplished by the use of a specially made dome cover, carrying two 2-inch connections and also provided with glass peep holes. It is made of aluminum and is bolted to dome by right-angled bolts.

The arrangement for loading under pressure described here has many advantages. It can be made of standard equipment and fittings found around the plant. It is easily and quickly connected and disconnected.

The device consists of a 2-inch angle valve, which has had both valve and stem removed. A hollow rod approximately the same outside diameter as the stem is carried in the valve. It extends from about 10 inches above valve through the dome to about 4 inches below the shell of the car. Friction on the packing nut of valve supports the rod. The end of rod above valve carries a one-eighth-inch pet cock. To the nipple extending from valve is connected a back pressure regulator or adjustable relief valve.

Before starting to load the rod is adjusted so that it extends 4 inches below shell of car. During the process of loading a small quantity of vapors will issue from the pet cock until the gasoline is within 4 inches of shell when liquid gasoline will come through pet cock. The rod is then raised 4 inches and car is loaded shell full as determined above. In case gasoline is boiling too violently the line to loading pipe is closed momentarily.



Loading device.

Practical suggestions by those connected with the construction and operation of natural gasoline plants are invited. Payment will be made as soon as suggestions are accepted. Address all communications to the Natural Gasoline Department, The Oil and Gas Journal, Tulsa.

NATURALINE PLANE IN FLOOD RELIEF

The airplane "Naturaline" of the Naturaline Co. of America, Tulsa, did valiant service in relief work during the recent Alabama floods.

When the floods started the airplane, in charge of Ralph Montie and Herbert Hardu, was at Jacksonville, Fla., having just completed a three weeks survey of southern airports for the Naturaline company, manufacturers of "Naturaline," a product of natural gasoline, which is now widely used as aviation motor fuel. D. E. Buchanan, vice president of the company, who was then at Washington, D. C., offered the services of the airplane in relief work and it was placed at the disposal of Governor Harris of Alabama.

Governor Harris and his staff used the airplane in trips over the flooded area to determine the best methods of carrying on relief work. Later the airplane was used in dropping food and clothing to marooned parties. Blankets, bread and yeast cakes were among the provisions which were distributed to flood sufferers over a period of four days.

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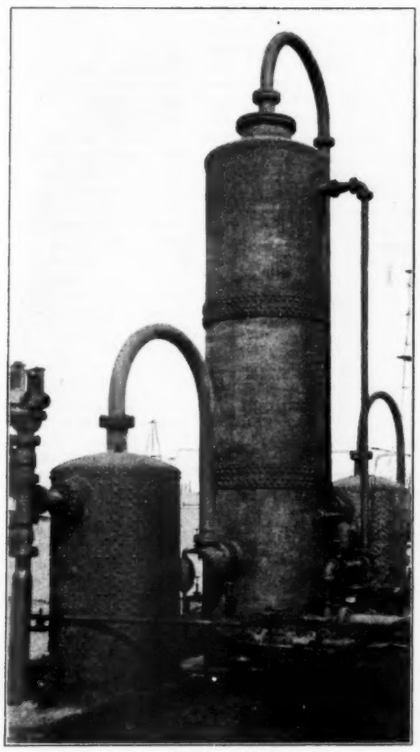

Automatic absorption unit in operation, Norwalk Co., Santa Fe Springs, California.

This unit treats 40,000,000 feet of gas per day at 300 pounds pressure and is located one mile from the main plant. The unit is entirely automatic in operation.

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Change for Better Expected in East Ke

Tank Car Gasoline in Another Decline Believed Temporary. Spot Situation Soft. Crude Curtailment Steadying Factor

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Mar. 25.—Tank car gasoline has gone into another decline in East Coast markets this week, but indications point to an early change for the better in the motor fuel market, consumption having picked up considerably with the advent of more seasonable weather. Kerosene is generally lower in tank car markets. Lubricating oils are sharply higher on cylinder stocks and export kerosene prices are up 1 cent per gallon both here and at the Gulf.

While the spot position of the gasoline market is extremely soft, there is every reason to look for an early change. A substantial improvement in buying has made its appearance, and refiners anticipate a continued gain in consumption from now on. Much of the market weakness has been caused by the unloading of surplus stocks by small and weak sellers. The large factors have been obliged to revise their own quotations downward to meet this competition, but it is not believed there is much surplus motor fuel remaining unsold in the hands of the smaller operators. The outlook for increased trading in export gasoline is a little brighter, and any real pickup in the movement of motor fuel into foreign consumption would react to the advantage of the domestic market.

Another constructive development expected to make itself apparent during the summer is the seeming success of the efforts of leaders in the industry to secure an actual cut in crude production which would aid materially in lightening the load of crude, and consequently tend to eliminate possible heavy overproduction of gasoline.

Tank Car Gasoline

Considerable irregularity has developed in the tank wagon price basis. Leading sellers are now openly quoting at 8¾ cents and the 9-cent basis appears to be a thing of the past, although a few sellers are still quoting that figure, but "meeting competition" in actual sales. According to some reports, business in U. S. Motor has been done by a few small sellers down to 8½ cents, but the larger factors are not meeting this figure, although conceding that some distressed gasoline has changed hands at that level.

While a number of operators had expressed the belief that the market would not go under 9 cents, the supply of "outside" gasoline which had accumulated in the market was evidently considerably larger than generally believed. In any event, the larger interests have been continually confronted with the necessity of "meeting competition" in their tank car sales, and as is always the case, this has taken the form of price cutting.

Standard of New Jersey is now booking business at 8¾ cents, and this apparently makes the market at that level.

Consumption has picked up materially in most sections, and refiners and marketers are looking for an early change for the better. Weather conditions during the first half of March were unusually severe over the entire East Coast territory, and demand for gasoline naturally suffered sharply. Since the mythical "first day of spring," however, there has been a material change for the better in the weather and motoring has consequently become more general.

Many jobbers, who have been down to a car-a-week basis on U. S. Motor gasoline are now indicating their intention of stepping up their contract withdrawals, and it is expected this increased buying will be reflected in the price at an early date. There is still a lot of delayed consumption which must be caught up with, however, and the trade will have to liquidate the large accumulations of motor gasoline before any general price advances can reasonably be looked for.

The monthly summary of the American Petroleum Institute covering stocks held at refineries east of the Rocky Mountains at the end of last month shows a net increase of 4,026,000 bbls. in gasoline holding as of February 28, over the stocks on hand at the end of January.

Tank Wagon Gasoline

The situation has undergone no important modification in this division of the market during the week. No general changes in tank wagon prices are reported, notwithstanding the easier market for the motor fuel in tank car markets. Any further decline in the tank wagon price, it is realized, would tend to further demoralize the tank car market, owing to the large number of marginal contracts held by jobbers throughout the eastern territory.

Sales are reported showing satisfactory gains throughout practically the entire East Coast. With milder weather at hand there has been a noticeable increase in the volume of motoring.

A little price cutting in retail sales is still reported in some quarters. Some independent stations are marketing U. S. Motor gasoline at 16 cents retail, 2 cents under the regular market. Premium grades are being retailed in several instances at 18 cents, on a par with the regular price for "white" gasoline.

Marketers in this area have shown considerable interest in the ending of the gasoline price war which has been disrupting Pacific Coast markets. The Pacific Coast area has been a hotbed of competition at several times during the past few years, and retail marketing of gasoline at 10 cents has been by no means uncommon. The end of the recent war came about through the action of leading interests in endorsing and subscribing to the industry's new code of ethics. With this example before them, the gasoline marketing fraternity in East Coast area should be in for a rather profitable marketing season in home markets, assuming the code will receive general recognition and endorsement by the leading factors in this area. The code is particularly timely for this area, as competitive lines in gasoline marketing are more sharply drawn in the East Coast territory this year than ever before.

Lubs

Another strong upward movement in cylinder stocks has developed this week, and gains of a half to 2 cents have been added to the fractional markups of the previous week. Much of the firmness is directly traceable to heavier export buying, although demand from the domestic trade has also shown material expansion on several grades.

Steam refined 600 is up a half cent this week at 31½ cents, with 635 steam refined up a similar amount at 34½ cents, with 650 a half cent higher at 38½ cents. On 600 Pennsylvania flash, the market is quoted 2 cents higher at 41 cents, and on 630 Pennsylvania flash prices are 2 cents up at 46 cents. Warren E, 600, is in extremely limited supply, and 1 cent higher at 35½ cents, while 600 Oil City E is up a similar amount at 34½ cents. Bright stocks are 2 cents up also, at 50 cents for light 140-150, and 48½ cents for dark 140-150. Offerings from the field are by no means heavy, and refiners are evidently anticipating another bull movement, such as that which showed such sensational price advances during the closing weeks of 1928 and the early half of January this year.

Pale oils have not shared in the strength which has characterized cylinder stocks this week. Sellers are quoting 25 pale paraffin oil at 10½ cents, off 1 cent from previous quotations, with 28 pale off a quarter cent at 7¼ cents. Business has been quiet along routine lines in this branch for some time, and stocks held at refineries are understood to be fairly large.

Reports among local jobbers indicate spot holdings of cylinder oils are by no means large, and consequently it looks like a sellers' market for some time. With a heavy export buying movement under way, and domestic consumption already beginning to show seasonal expansion, operators are endeavoring to book future lubs, but are not finding the refiners ready sellers. The A.P.I. summary of refinery stocks east of the Rockies for February shows a gain of but 29,000 bbls. in holdings of lubricating oils, a small increase at this season.

Kerosene

Notwithstanding the 1-cent advance in export kerosene at the Gulf and at North Atlantic ports, the domestic situation has weakened further. Leading refiners are now booking business at 8 cents, off a half cent from recent quotations. Demand has fallen off with the advent of milder weather, and considerable selling pressure has made its appearance in some quarters of the market. In one or two instances, sellers are making a semblance of maintaining an 8¼-cent quotation, but business can be freely booked at 8 cents. In some quarters, the belief is expressed that the tank car market is due for an early upward reaction, in line with the strength in the export market.

Tank wagon kerosene sales have fallen off further during the week, but the market holds unchanged on the basis of 15 cents in this territory. Marketers report that sales in New England are still holding up well, but the peak of the season's consumption appears definitely past in New York.

Fuel Oil

Volume has been well maintained in this branch of the market. The bulk of the movement continues to center on shipments against standing contracts, with refiners continuing to quote $1.05, bulk, at refinery terminals, and $1.10, delivered alongside within the harbor limits. While fundamental market conditions have not undergone any radical changes, announcement of the curtailment plan in crude production has been taken as an encouraging development with respect to the future of the fuel oil market. However, the big factor in fuel oil is the attitude of Venezuelan producers toward conservation, and it is not expected anything in the nature of real substantial improvement in bunker "C" will be witnessed while the present plentiful supply of cheap South American crude continues available. Thus far, nothing definite with respect to any real curtailment program in Venezuela has developed.

Furnace oil business has slackened further, and the market is not as strong. Marketers believe the big movement for the year is at an end, and there is some tendency on the part of jobbers to trim down stocks, with additional purchases radically curtailed.

Diesel Oil

A steady market prevails, with 28-30 quoted unchanged at $2 bulk, at refinery terminals. Consumption is being well maintained, and marine sales are showing gradual, but consistent, expansion.

Considerable quantities of low-grade gas oil have been marketed as Diesel fuel in this area during the past few months, and a little price shading under the $2 level has been done on this fuel in a few instances.

Gas Oil

The market is showing a little softness in this area, and offerings are somewhat larger. Stocks are available rather freely at 5 cents, although the leading seller is still quoting a half cent over this figure.

Consumption on the part of the large artificial gas companies continues an important factor in the local market. While the demand for shipments against resale contracts from these interests has held up well this week, there has been some falling off in the amount of open market buying done by the gas companies.

Lower grades are moving out as furnace oil at as low as 4¼ to 4½ cents, it is reported.

Petrolatum

Some improvement in the export situation is reported this week, buyers being in the market for fairly large quantities. Prices, however, have not been affected.

Domestic inquiry for petrolatum is still rather sluggish, with sellers looking for early improvement. Stocks of some of the largest domestic consuming manufacturers are believed to be running low, with replacement buying in sight.

Paraffin Wax

Irregularity continued to characterize trading in paraffin wax, and the price basis was far from settled. A little shading of spot quotations on the low melting points of fully refined was reported in some quarters, although it appeared that selling pressure was lighter. With sluggish spot markets in effect over the greater part of the month, some refiners had pushed out a little stock at concessions, and operators in some instances were in position to make prompt shipment sales under the established levels. Refiners were firming up in their price views on refined, and the trade was inclined to look for some stiffening.

Domestic consumers have been inquiring for stocks in slightly better volume. Sales for spot and nearby delivery are a little better, and the trade is looking for more activity during the second quarter.

Export buyers have been picking up odd lots for immediate delivery, but are showing but little interest in the later positions. The local jobbing trade, it is reported, has not taken as strong a position as a year ago, when operators had booked a considerable proportion of the potential production well up to the beginning of the third quarter.

Exports

There have been no further changes in export gasoline prices, either at the Gulf or at North Atlantic ports. More interest in offerings was reported, after a cargo was sold out of the Gulf at ruling prices. This cargo, totaling 7,8[illegible] tons, consisting of 6,400 tons of 64 and 1,400 tons of Navy, went to Fran[illegible]. Operators are figuring on a 10,000-[illegible] cargo of California gasoline for shipment to London, but this cargo had not been closed. Operators are looking for material improvement in export buying shortly. Seasonal increase in consumption can be looked for in European markets, and the ending of the Russian price war in British gasoline markets with consequent mark up in selling prices is expected to make for heavier demand for American gasoline for shipment to England.

Fuel oil shows marked firmness on the Gulf. Sellers are still quoting

(Continued on Page 141)

Kerosene Tank Wagon Advance Helps

Spot Demand for Gasoline in Chicago Area Monday Not Heavy but Larger Demand Is Looked For

By J. B. Waldo

CHICAGO, Mar. 25.—The increase in the tank wagon on kerosene gave a very firm tone to the market for light products today. The demand in the spot market was not heavy on Monday but for several months the local trade has noted that Monday was not as good a day for sales as Tuesday and the sales managers look for a larger spot demand for gasoline later in the week. There were number of buyers who offered to buy April shipments but wanted the price be on the same basis as earlier in this onth. Most, if not all, of the larger finers had advanced their price for S. Motor gasoline to 7⅛ cents and ere was very little available at less an that price, although there are some w cars left from earlier purchases that ere offered at one-eighth to one-quarter s for immediate acceptance. The vol- e of this gasoline is not great, but ere is some that must be moved before e end of this week that can be sold at s than the present market and these fers will be heard from. There was very tle demand for the higher tests, and, hough refiners generally advanced ese prices with the U. S. Motor grav- , offers at the former rates were freely de and brought little new business.

Kerosene was very strong with refin- s asking 6⅜ to 6½. One refiner ad- nced his price to 6⅝ at noon Monday, ating he had been offered that price by sellers in the group. There was some quiry from exporters, but generally the mand was not very active from the bbers. Many refiners have urged their bers to stock up and many have done during the past two or three weeks so at many sellers do not anticipate an ly increase in the demand unless it from small buyers. Some of the large tributing organizations expect to re- ire additional supplies besides what ir own refineries can turn out.

Furnace and Fuel Oils

The demand for furnace oils was light d prices on gas oils and distillates y. There were a number of good in- ries in the market from users of in- trial fuel oil for their April require- nts. The offerings of the low sulphur s continued light and the price situa- n is unchanged both as to these and heavy oils that are high in sulphur. lder weather with some rain and snow parts prevailed over the week end and predicted for the early part of the ek.

Between Seasons

The sense of the near approach of the e of larger sales of motor fuels was reased by the unusually fine weather this locality over the first three weeks March. Officially spring arrived on twenty-first and immediately the ather changed to cold and wet but Chi- o is used to such changes and it was thout any real effect on the gasoline rket. Reports from the northwest w better weather has done much to re- e the heavy accumulations of snow d ice but some parts are still weather nd by surplus water and bad roads. It be some weeks yet before the North- t as a whole will be in good shape.

There was a growing strength in the oline market with the price of 7 cents ering the majority of the sales. Oc- sionally a price was made of 7⅛ or n 7¼ cents but there was plenty of terial still available at 7 cents for S. Motor gasoline and this was the ing price most of the week. Occa- nally some buys were reported at s but in every case that could be read- ily traced to some special circumstance. In some instances refiners had small lots of a few cars they wanted to move for some reason best known to the refiner and one sale of this kind was made to a marketer at 6¼ cents. This particular lot was readily resold to other marketers for the most part at 6½ cents. It was good material but there was just so much of it and the quickness with which it was disposed of showed that the price was under the market range. Some gasoline bought for March delivery has also hung fire owing to the delay in securing shipping instructions and some of this has been offered at less than 7 cents for a quick sale and shipment. There were not enough of such instances and the quantity of the material offered was not sufficient to make it possible for many buyers to secure some of the cheap gasoline.

Consumption Increasing

Motoring has increased greatly and the reports of the larger oil distributors with stations covering a large part of the territory show there is a larger consumption. Several larger companies have placed an estimate on the increase in their March distribution at 25 per cent over last year. With the smaller organizations which are confined to less extensive districts the reports are not so unanimously favorable. Some have stated their March gallonage is larger than a year ago, others that they see no difference or that it is not quite so large. These varying reports are due to local conditions both of weather and of increasing competition. Motorists must be supplied with motor fuel and even now when the number of stations all over the territory is considered by authorities to be unnecessarily large, there are new outlets being built and older stations being enlarged.

Spot Demand Just Fair

The spot demand for U. S. Motor gasoline, which with the special brands of antiknock material, forms the great bulk of the sales, was just fair for the season. Some reported their business as disappointing in spot sales. Generally there was better buying against contracts and the movement as a whole was larger than it has been. There are some reasons for the lack of activity in the spot market. Among them must be considered the number of independent stations now owned or controlled by lease or some form of contract by the major companies which refine and distribute their own product through their own stations and those of their contract customers. An executive of one of the national integrated companies recently stated that his organization had bought 38 independent oil companies. He did not give the list of the concerns acquired but some of them are known and for the most part they are among the larger independent oil companies. Others of the major companies have done as much or nearly so.

In Chicago the new Q.D.A. scale makes it difficult for a refiner to sign up a dealer on a marginal contract. One of these Q.D.A. contracts with its 4 cents under the service station price, makes the gasoline cost the dealer delivered in tank wagon lots at his plant but 11 cents. Contrasted with this price is that secured on a marginal contract with a straight guarantee of 3½ cents under the tank wagon price which while it might yield a price of 10½ cents involves the ability to take in and pay for tank car lots. This condition tends to reduce the quantity of spot buying.

Another factor is the co-operative organizations of oil men. These buy considerable quantities on the plan of purchasing for their monthly needs in bulk and delivering to the members. Each one of these monthly purchases takes a certain number of independent oil companies out of the daily spot market. There are other factors to be considered all tending to reduce the importance of the spot buyer such as the method of the larger concerns of filling their storage early in the season with supplies which are ample for their needs in some cases until June or even July. Of course these buyers will add to their storage when they can do so at a low price compared with the going market but they cannot be counted upon for regular spot business at the market price.

Refiners Ready to Ship

Some of the new refining organizations began to deliver gasoline to their customers during the month and others that have had their plants delayed a little now state they will be able to ship shortly and are seeking to make contracts with jobbers. Some refiners that have been closed down during the winter are beginning to start their plants and will be able to ship shortly. These refining organizations will add to the available supplies but they should have no more real effect on the market than did those who operated in a like manner last year, on last season's market. The situation seems to sum itself up as follows: We know there will be a larger consumption than a year ago and that there will be more sources of supply. The result is a matter of debate right now in this market. All seem to feel the market is bound to go higher as the demand develops but just how much the price will advance is a betting proposition right now. Some contracts are being made by refiners with other refiners that will use some of the surplus the latter had last season. One of the larger integrated companies in the Central West has contracted with another like situated for a large quantity of gasoline for delivery over the next few months. The full details of the contract have not been made public but the quantity runs into the thousands of barrels. More of these contracts are likely to be made for there were several of the large refiners who had to buy extensively last season and they are estimating their requirements and providing in advance for their needs.

Price Situation

As stated the price situation on U. S. Motor gasoline was firm at 7 cents in this market with only minor and occasional variations. The higher tests were dragging and in only light demand. The special antiknock fuels were moving steadily and at regular prices. There have been many inquiries from independent distributors for the Ethyl Gasoline which will be generally available over the Standard of Indiana territory this season and evidently many jobbers are planning to make this their premium line. There was no change in the situation to the east of the territory in Ohio where the quoted prices for U. S. Motor gasoline in tank car lots was 9¾ to 10 cents but this price was not the bottom by any means, according to buyers in that State. The intrusion of southern and eastern gasoline in Indiana is stated to be increasing and great rivalry is shown by the larger organizations for business in that State. Some dealers have reported they have had offers of contracts which show a margin of 5 to 5½ cents below the service station price but the refiner stated to be offering these contracts denies doing so absolutely. Natural gasoline has shown strength here as the primary markets have been advanced by heavy purchases by some of the refiners it is claimed who bought extensively from West Texas refiners earlier in the month.

Kerosene Strong

Kerosene is moving, some say slowly and some in good fashion but there is no doubt that supplies are limited and the market very strong. Early last week there were at least four of the major refiners in Oklahoma still doing business at 6 cents but they gradually advanced their prices until they were on the 6¼-cent basis. Several larger integrated companies with headquarters here explain they have not enough kerosene for their own requirements and are not quoting except to their regular customers and as they have to buy in the open market, they named the top price, asking 6¼ to 6⅜ cents. The tendency at the close of the week was strongly upward and yet marketers with a few cars to sell say they find it difficult to place the material. On the other hand refiners who were asking the 6-cent price a week ago stated they did so much business they were really obliged to advance their price to protect their own reserves. The tank wagon advance came too late for its full effect to be seen last week.

The furnace oil demand was very limited all of last week. Late in the week the weather turned somewhat less springlike and this will help distributors in working off supplies in their tanks but they will be slow to order additional supplies until forced to do so by continuance of chilly weather. Distillates were particularly draggy and the prices were easy and lower. Some refiners who were out of distillate during the time of greatest need now have some supplies on hand and one has reduced the price from 4½ cents asked for 38-40 distillate gradually to 4 cents to the trade and has been seeking business from marketers intimating offers would be considered at the buyer's idea of the present market. A lengthy period of cooler weather would result in considerable consumption but the demand would be irregular and what was wanted would be wanted in a rush.

Gas Oils Easier

Gas oils are a little easier in price but as there is a continuing demand for gas oil all the year round, there is less decline in prices than in distillates. A major source of supply has reduced the price of its straightrun and zero gas oil to 3 cents from the peak price this season, with this company, of 3¼ cents. The zero oil is a blended product. Naturally with the higher temperatures prevailing at present the premium paid for zero oils is dwindling and must soon disappear. The gas companies are inclined to draw from their stocks where they are not covered by contracts and keep out of the market as much as possible. Some gas companies have accepted recycled oil when the sulphur content was low who previously have insisted on the straightrun product. Several refiners have stated they had no straightrun oil for sale saving it for their own crackers or having sold to The Texas Company, or other larger users of the oil as cracking material. There are some gas oils being offered, a little, or more than a little sometimes, off the regular specifications and these are now coming to market at a lower price than the full 32-36 gravity although during the peak of the demand they were sold as regular gas oil and at the full price.

Fuel Oil

In the fuel oil market the chief change is the gradual disappearance of the premiums paid for low cold test oils. Prices for the lighter gravities in zero oils have been very high by comparison with other fuel oils this season although the entire price range has been low by com-

(Continued on Page 141)

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FOR SALE complete set Standard Tools. 12×12 AJAX engine (NEW). 2,000 ft., 6⅝ inch, 24-pound. 700 ft., 10-inch, 52-pound. 1,500 ft., 2-inch pipe. F. E. Turner, 217½ Broadway, Muskogee, Okla.

BOILERS—New 40 hp. non-code oil country type complete mounted or unmounted. Special Price. Star Drilling Machine Company, Chanute, Kans.

HYDRAULIC PUMPS

2—5″×20″ GOULD HORIZONTAL HYDRAULIC PUMPS. Horizontal triplex, double-acting type; outside end packed; Gould's figure No. 1,521; 365 gallons per minute; 12,500 barrels per 24 hours; 1,000 lbs. working pressure; 5″ diameter of plunger; 20″ stroke; herringbone gear and pinion.
Real attractive prices.
Louis E. Emerman & Co.
1761 Elston Ave.
Chicago, Ill.

FOR SALE: Steel frame Leidecker Drilling Machine and Tools. Everything good condition. Machine has new Band Wheel, Bull Wheels, and Mast. Price $1,500.00. P. O. Box 3061, Tulsa. Phone 7135.

FOR SALE a diamond core drill. Texas delivery.
W. S. Brennan
Sweetwater, Texas.

FOR SALE
12 miles of second-hand 8″ line pipe and we are abandoning about 200 wells in Ohio and Indiana and offer for sale 2″ line pipe, 2″ tubing and rods, 5⅝ and 6¼ casing, 8″ 29 pound drive pipe, iron power rods, powers, engines, jacks, etc. For further particulars write, WEST OHIO PIPE COMPANY, P. O. BOX 399. Lima, Ohio.

REDUCE your Wiper costs by using White or Colored Cotton Waste. Costs less. More wiping surfaces. Also washed and sterilized Wiping Cloth and Wool Waste at reduced prices. Overnite shipping service. Manufactured by AMERICAN SANITARY WIPER & WASTE CO.
511-513 Broadway, Victor 2909-2910,
Kansas City, Mo.

FOR SALE—EQUIPMENT

FOR SALE
Rotary & cable tool rig, 7,000 feet 6⅝ and 5⅛ casing, also well 2,900 feet deep, 9 miles from Marland Core-drilled location. Woodward County. Write, wire, Stith, 522 N. Haskell, Dallas, Texas.

SPECIAL
5,500 ft. of 6¼″ Natl. seamless A.P.I. 28-lb., 10 thread casing. Once run and in practically new condition.
The Grimes Pipe & Supply Co.
Denver, Colo.

FOR SALE: 10″ Wilson Underreamer, less lugs. Good condition. Cost over $500. Left with us to sell, by contractor going out of business. Price $125.00. Okla. Pipe and Supply Co., Bartlesville, Okla.

EQUIPMENT WANTED

WANTED TO BUY scrap iron. Will pay highest market prices. Appreciate information regarding location, tonnage. Write or Wire, Garson Iron & Steel Co., First National Bank Bldg., Houston, Tex.

DRILL RIG BARGAIN
Light rotary rig; 45 Hp boiler and engine; about 1,500 ft. 3″ and 4″ drill stem; all in good shape. Half mile from railroad station in Montgomery County, Texas. Will sell at bargain for cash. Address S. S. Russell, 55 DeMenil Bldg., St. Louis, Mo.

WANT DRILLING OUTFIT. Derrick, Rig irons, Sills, without tools. Prefer steel Derrick, but will consider solid wood leg Turnbuckle outfit. For shipment west. Mail list of what you have, location, and best price. Address Box C-824, The Oil and Gas Journal, Tulsa, Okla.

OWNERS of idle rigs, tools and casing willing to let them on an interest basis in the next big oil play, address Box C-863, The Oil and Gas Journal, Tulsa, Okla.

EQUIPMENT WANTED
We are preparing to drill a semi wildcat well near Colorado line and will give a substantial interest for the use of 7,500 feet two inch line pipe, 150 feet 15 inch and 700 feet 12½ casing. If interested Address Box C-862, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS REPRESENTATION

DO YOU WISH TULSA REPRESENTATION? Can handle your Tulsa Correspondence and Business. Have telephone and Post Office Box. Write S. B., Post Office Box 390, Tulsa, Okla.

BUSINESS OPPORTUNITIES

MR. INVESTOR, ask for our FREE folder on an outstanding oil investment for 1929. Trans-American Oil Corp., 407 Perrine Bldg., Oklahoma City, Okla.

CAPITAL SEEKERS—Put your project before 260 livewire brokers—cost trifling. Details free. Amster Leonard, East Orange, N. J.

THIRTY-FIVE thousand dollars wanted for development 2,000 acres; proven for commercial gas and some oil. P. O. Box 385, Houston, Texas.

HAVE 20,000 acre drilling block in Northern Hudspeth County, Texas. 10,000 acre drilling block in Cochran County, Texas. 15,000 acre drilling block in Hockley County, Texas. Plenty of time to start operations. Well located geologically. Want financial aid. Garland A. Tunstill. P. O. Box 907. Ft. Worth, Tex.

NEED CAPITAL?
For $35 we'll prepare a strenuous Sales Letter and furnish Several thousand Prosperous Investors names. Mail order Campaigns and Stock Prospectuses written, any Business. Prosperity Advertising Service, 1819 Broadway, New York City.

UNLEASED LAND in Shell Pet. Co. block 320 acre Cotton Co. Red River valley farm. Will give one-fourth royalty and mortgage on land for loan of $7,350 to prevent foreclosure. Box C-842, The Oil and Gas Journal, Tulsa, Okla.

WANTED financial help on great oil proposition. Opportunity of a lifetime. J. T. Stanford, Baldwin, Michigan.

BUSINESS OPPORTUNITIES

STOCKHOLDERS LISTS
Have 1,600,000 Stockholders in 1,200 companies, oil, mining, and industrial. Ask for Price List showing name, number in list, and price.
A. F. Williams
166 West Adams St.
Chicago, Ill.

RESPONSIBLE Oil Operator wishes to get in touch with parties owning production and proven acreage. Object the merging of several small concerns into one large Company with sufficient finances and proper management to place on dividend paying basis. Give full particulars in first letter as to properties you own or control. Principals only. Address Box C-861, The Oil and Gas Journal, Tulsa, Okla.

POSITIONS WANTED

TRAFFIC MANAGER with long experience with leading Oil Well Supply Manufacturers, at liberty after March 1. Wants to locate in West or South. Willing to start at reasonable salary and let results care for future. Box C-752, The Oil and Gas Journal. Tulsa, Okla.

LAWYER, Four years tax and title experience wants to connect with oil company. References. Box C-822, The Oil and Gas Journal. Tulsa, Okla.

GRADUATE MECHANICAL ENGINEER, married, with three years experience in refinery maintenance and construction, desires position with chance to work into position of responsibility. Would consider sales work. Now employed but good raesons for desiring to change. Address Box C-834, The Oil and Gas Journal, Tulsa, Okla.

Competent electrical, telephone, telegraphy designing and estimating engineer three years University and fourteen years practical training. Now employed past three years with large oil company. Desires position with major oil company where there is a future. An interview would be appreciated. Address Box C-833, The Oil and Gas Journal, Tulsa, Okla.

POSITION WANTED
An executive and part owner of an independent oil company who has been in the oil business several years, and has had very broad experience, both as an executive and in various branches of the oil business, has sold his holdings, and would consider a position with good reputable oil company, if compensation and future possibilities are satisfactory. Capable of taking charge of Land Department, operations, sales department, or any other executive position where ability and efficiency count. Can convince anyone as to ability and qualifications. Prefer position in United States, but might consider foreign service if salary and working conditions justify. Best of references furnished on request. Box C-845, The Oil and Gas Journal, Tulsa, Okla.

YOUNG MAN 34, member of the bar and skilled in accounting and financial procedure. Former U. S. Treasury Department tax official and now practicing tax counsellor desires permanent connection with oil company or allied industry. Salary secondary consideration to a position with opportunities. Box C-851, The Oil and Gas Journal. Tulsa, Okla.

EXPERIENCED Trained man wants permanent connection foreign or domestic. Production or marketing. Educated some Spanish. References. Box C-852, The Oil and Gas Journal. Tulsa, Okla.

ENGINEER with 10 years experience covering production methods, refinery design, construction, operation and maintenance, desires position as Purchasing Agent, Construction or Maintenance Engineer. Box C-664, The Oil and Gas Journal. Tulsa, Okla.

PRODUCTION and Drilling Superintendent with over 25 years practical experience will be available about April 1st, for position. Can handle any kind of proposition, Rehabilitating old properties is my specialty. Address Box C-860, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

WANTED—High grade sales representative understanding rotary and cable tools and supplies. Must be willing to go to South America. Give full details as to qualifications, experience and connections in your first letter. Box C-846, The Oil and Gas Journal, 101 Park Ave., New York City.

HELP WANTED—High class Refinery Engineer familiar with Steel Plate Fabrication and with Shop Practice—needed by Nationally known Equipment Manufacturer. Communicate with Box C-847, The Oil and Gas Journal, Tulsa, Okla., and interview will be arranged at convenient point.

OIL REFINERY DRAFTSMEN

COLLEGE TRAINED MEN PREFERRED. STATE EXPERIENCE IN DETAIL AND SALARY DESIRED. SUBMIT PHOTO WITH APPLICATION. REAL OPPORTUNITY FOR HIGH CALIBER MEN. LOCATION JERSEY CITY. BOX C-850, THE OIL AND GAS JOURNAL, 101 PARK AVE., NEW YORK CITY.

ENGINEER wanted by firm in New York City, widely known in Oil Industry. Must be thoroughly familiar and capable of designing Oil Distillation Plants. Mechanical and Structural experience essential. Write stating Age, Experience and Salary expected. Address Box C-812, The Oil and Gas Journal. Tulsa, Okla.

WANTED Pumping Jack salesmen in deep territory. Give reference. P. O. Box 88. Tulsa, Okla.

WANTED—Four men for positions in new refinery in West Texas; experience not essential; salaries will range from $175 to $250 per month; each applicant will be required to invest a few thousand dollars cash in the business at time application is accepted; money is wanted for the purpose of completing plant; this is a real opportunity for right parties. Big Lake Refining Company, 317 Alexander Bldg., Tulsa, Okla.

WANTED: Planetable man. Must have 3 or 4 years experience. Must be reliable. Laughlin-Simmons and Co., 600 Oklahoma Gas Bldg., Tulsa, Okla. Phone 3-5985.

ADDRESSES WANTED

DR. STEWART MACAKANZIE, your old friend from the Royal Agency would like to hear from you. Important. Michael Murphy, 19 Pleasant Place, Tuckahoe, N. Y.

MANUFACTURING MACHINISTS

MACHINE WORK—CASTINGS
Machined to your drawings. Gears. Machinery designed and built.
Modern Facilities—Prompt Service. Reasonable prices. Send for our booklet.
GENERAL ENGINEERING AND MFG. CO., ST. LOUIS, Mo.

GEOLOGISTS

OIL LOCATED before drilling. Geophysical method. Magvibrometer Instrument; take pay in oil. No oil, no pay. Except traveling and testing expenses. 90 per cent accuracy. O. P. Coffin, Caddo, Texas.

WANTED

Will the parties who have been to see the McCAULEY family at COLTON, CALIFORNIA, as late as December, 1928, regarding certain Texas Oil Land communicate with T. C. McKenna, Lawyer, 600 Black Building, Los Angeles, California.

INCORPORATIONS

DELAWARE incorporator. Charter fees small, forms. Charles G. Guyer, 900 Market St., Wilmington, Del.

CHARTERS—Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

35 CENTS a line first insertion; 25c a line each additional insertion. Cash in advance.

CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

LEASES—PRODUCTION

We have about 10,000-acre Block Reno County, Kansas. Want drilling proposition for acreage. For quick information, address F. C. Purdy, Sterling, Kans.

LEASES AND ROYALTIES

Close in to production, Sedgwick and Harvey Counties, wire or write. Southwest Investment Co., 205 Orpheum Bldg., Wichita, Kans.

ROYALTIES AND LEASES, BOUGHT AND SOLD.
25 years experience in the Mid-Continent oil fields. E. J. Davied, Fort Stockton, Texas.

BROKERS AND OIL MEN—
I have under lease 5,000 acres in Illinois near good producing oil field, which oil men claim has a feeder. I have located what geologists have been looking for. Sand rock, a ledge six feet thick underlays this location, also other good formations. I am willing to let some good men or company in to help finance this and share results. Would appreciate the advice of any geologist you may have or consult. Will be in Illinois about April 1. This will bear strict investigation. Virgil Cox. Rialto, Calif.

For Sale—Southeastern New Mexico leases. Orcutt-Harris & Co., Oklahoma City, Okla.

WINKLER, PECOS, WARD, Loving and Reeves Counties. Leases and Royalties. Hemby & Anderson, Box 633. Pecos, Texas.

WINKLER—PECOS COUNTIES
Leases and Royalties
W. S. PATTERSON
Pecos, Texas

FOR SALE

OIL and Gas Leases, blocked, of approximately 800 acres, located in Allen County, Kansas, between the towns of Chanute and Humboldt. 79 producing wells, 25 barrel production; Shackle system of pumping, with six powers. Extra material in yard for about eight wells. Wells average about 850 feet. Artificial pressure or vacuum never operated on the premises. Should make an ideal pressuring proposition. This property if sold within the next sixty days can be bought at a very attractive figure. Address BROKER, 1502 Commonwealth Bldg., Pittsburgh, Pa.

AM OFFERING undivided acreage units on Kansas acreage offsetting producing wells at $100.00 per unit. Open for either large or small investor. Address Box C-849, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE

300-acre oil lease located in Cowley Co., Kansas, on good structure close to producing wells. Address Box C-848, The Oil and Gas Journal, Tulsa, Okla.

NO GAMBLE
BUT A SAFE INVESTMENT
THREE EX-SOLDIERS OIL GAS ROYALTY OPERATORS TRUST COMPANY. Your investment is safe-guarded against loss at all times by a guaranty mortgage bond, if you are interested in receiving further information write, Wm. J. Kline, Sec'y., 2973 Riverside Drive, Cincinnati, Ohio, or L. E. Troxel, Field Manager, Gallup, New Mexico.

LEA COUNTY, NEW MEXICO
Perpetual Royalties.
W. S. Patterson
Pecos, Texas

BROKERS: Western Oklahoma leases, drilling blocks, royalties. Joe P. Crawford, Oklahoma City, Okla.

Inexhaustible Gas Wells at 300 Feet
1,500 ACRE BLOCK in Southeast Kansas right against a new Industrial Gas line that is raring for gas, 5 gas stratas 180 to 850 feet, gas production on all sides. Year around market at eight cents at wells. No line pressure to buck. Long life sand gas wells and practically no decline to shale or Oswego wells. Almost impossible to drill a dry hole. This is the finest little gas proposition you'll ever see and the block is for sale. Address P. O. Box 533, Bartlesville, Okla.

160 ACRES or more of potential oil land, adjoining the Isles dome, for lease. Mrs. J. F. Schmidt, Box 92, Craig, Colo.

LEASES—PRODUCTION

FOR SALE

3,200 Acres Oil, Gas and Mineral leases on Mitchell Creek Anticline, Clay Co., Tenn., adjoining Gas wells and Oil Production.

J. G. Webb
Box 545 Louisville, Ky.

WANT TO BUY small production located in Okmulgee County. Address Raycomo Oil and Gas Co., Orrick, Mo.

For Sale—Fullers Earth Deposit, superior quality. Accessible and over burden light. J. H. Hodges, Apalachicola, Fla.

740 ACRES Hudspeth Co., Texas, in fee, all mineral rights included, priced right. Geo. F. Simmons, Bellevue, Texas.

SCURRY COUNTY lease Block 15,000 acres. Subsurface geology very favorable. In trend of production $2.00 per acre. MITCHELL COUNTY leases near Simms well drilling on Elwood ranch $5.00, up. YOAKUM COUNTY leases in T. P. Block, $3. PECOS COUNTY royalties. Near Pecos valley producers, in trend $10 acre base. GAINES COUNTY royalties SW part $7.50. LAND IN FEE Brewster, Presidio, Culberson and Reeves counties, bonus $1.50 up. J. L. FERGUSON, Box 462, San Angelo, Tex.

BRAZORIA COUNTY, Texas, sacrifice 100 acre improved farm best oil proposition in gulf coast $30.00 acre 1/8 minerals reserved aside from oil possibilities excellent farm land now bringing good revenue.

1105 W. Drew St.
Houston, Texas.

NEW MEXICO LEASES

3,500 acres scattered in Roosevelt County will sell at $1.50 per acre. Box 358, San Angelo, Texas.

ABOUT to drill 3,200-foot well, heart of famous Texas oil field, 1,000 to 5,000-barrel gushers close, geological data indicates my undrilled lease will produce equal to any; acceptable associates wanted or acreage will sell offsetting drilling tract. Write, wire or call for information that will fill all requirements of geologists, practical oil men or investors who will consider only the best.
E. L. STRATTON
2104 Fort Worth National Bank Bldg.
Fort Worth, Texas.

720 ACRE LEASE for drilling contract, on good structure. Directly between Fluhman and Mathews Pool, Wilbarger Co., Texas. T. H. Haney, Box 103, Thalia, Texas.

FOR SALE—Leases, Oil Production, Asphalt, Limestone and Other Mineral Lands. W. P. Harley, Bowling Green, Ky.

DRILLING blocks, leases, royalties in Ellis, Trego, Rooks, Norton Counties. Write or wire W. J. Madden, Hays, Kansas.

FOR SALE about 3,000 acres Oil and Gas Leases. Near Chanute in shallow field. Write Box 342, Chanute, Kans.

FOR SALE 60 acre Lease in Section 59, Block 34, Ward County. Two 60 acre (joining Tracts) Section 15, Block 178—H.T.R.R. Pecos County.
Dave Goodman,
931 Waverby St.,
Houston, Texas.

MOORE COUNTY, TEXAS

Will lease for oil and gas N.W. quarter of Section 3, Block P-Mc. near production. Attractive proposition. Address Hazelle R. McCabe, 33 Oak Lane, Davenport, Ia.

CRACKERJACK LEASE play. Small investment. Ford and Co. Dept. G1, Roswell. New Mexico.

FOR SALE—320 A. Federal Permit, Sec. 22, T 24 S, R 35 E. Lea Co., N. M. Surrounded by Gypsy, Marland, Midwest. These companies under new ruling will have to drill soon or lose permits. A good play, Make offer. P. O. Box 14, Glendora, Calif.

LANDS, Leases, Royalties and drilling blocks in proven or unproven territories, Winkler, Pecos, Ward, Loving, Reeves, Culberson and adjoining Counties. Wire or Write.
H. F. Anthony, Anthony Bldg.,
Pecos, Texas.

LEASES—PRODUCTION

HARVEY COUNTY, KANSAS
Abstracts furnished promptly.
H. A. Brush Newton, Kans.

ATTENTION
LEASE BUYERS AND INVESTORS
We represent hundreds of California owners of New Mexico State Oil Leases in the trend of development and offer some wonderful buys in Lea, Eddy and Chaves Counties. Barnhart-Powers, 1404 Franklin St., Oakland, Calif.

CADDO COUNTY
OIL LEASES AND ROYALTIES
C. W. Ludwick
Fort Cobb, Okla.

OIL LAND FOR LEASE and drilling, located Tr. 1. N. W. 1/4 Sec. 30. T. 22. R. 12. E. 160 acres, Osage County, Oklahoma. George Wagner, lease owner, 3715 Melbourne Ave., West, Cleveland, Ohio.

WILL LEASE 80 acre North or South of Handy Tract. 160 acres Erath County, land adjoining Kelsey Well, $20 per acre. Heron, Gordon, Texas.

30,000 ACRE Lease in Harding Co., New Mex. Will sell or make drilling contract. Have Geologist's report. Plenty of structure in sight. Also for sale or lease. 160 acres Grey Co., Texas. 1½ miles from big wells at LaFores. W. H. Woodlief, 728 N. Fillmore St., Amarillo, Texas.

LEASES—Royalties and blocks ahead of drilling wells. Western part of State, write me what you want. Address Box C-844, The Oil and Gas Journal, Tulsa, Okla.

SACRIFICE: Circumstances compel sale perpetual royalty of 1/32th and 7/8 ten year commercial lease, 25c annual rental, 2,240 acres Lynn County, Texas, Northwest Hart-McCamey well, in trend, surrounded by major company leases, regarded on torsion balance and siesmograph high. Price $12,000.00 cash, with 5% to brokers. Possibility that lease alone will sell within three or four months at double my price for both. Address fee owner, L. Wesley Read, Lubbock, Texas.

IF YOU wish to take a "Flyer" in the "Oil Game," write Walcott, 405 Continental Bldg., Oklahoma City for proposition. 5,600 acres of land in Oklahoma's largest proven field with more than Eleven Million Dollars in Oil Already produced.

THE
HATCHETIGBEE
ANTICLINE

Choctaw and Clark Counties, Alabama, is fully described in U.S.G.S. Bulletin No. 661 H. We are now rigging up for a deep test on this structure, and have a limited amount of acreage for sale, long term leases and low rentals. Several of major companies have purchased leases from us. Will drill with our own rig and make careful test. This is one of the largest undeveloped structures in this country and gives great promise of production. For full particulars address C. W. Robinson, 611 City Bank Bldg., Shreveport, La.

FOR SALE—Choice 80 acre Oil and Gas Lease W½, NW¼, Sec. 32-T17-R32, Lea County, New Mexico. P. O. Box 558, Chanute, Kans.

70 ACRES Borger field adjoining producing wells with gas and water free for drilling. Will lease for small overriding.

Dr. B. B. Ralph,
529 Highland Ave., Kansas City, Mo.

PROMOTERS, TAKE NOTICE

Lease and shallow production for sale 4 miles West Brownwood, Texas, 3 Producing wells. 2 air key wells. Eight thousand dollars worth equipment on lease. Sixty-four acres undeveloped; all set for repressuring. Good chance for big gasser in lime. Terms.
May & Garrett
Santa Anna, Texas.

WANTED production of 25 to 50 barrels in Okla. with several wells. P. O. Box 1992, Tulsa, Okla.

LEASES—PRODUCTION

MINERAL deed 40 acres in Jim Hogg and Zapata County. Will sacrifice for quick sale. Edwin Malm, Box 523, San Antonio, Texas.

STATE OIL AND GAS PERMITS on West Texas School Lands. Fifty Sections. Guy R. Holcomb, Attorney, Austin, Texas.

WE ARE OFF!

Our 112 foot derrick is up—our own drilling rig rigging up and actual drilling will start Thursday, the day this goes to press. We have had over a hundred requests for our plats and geological report. Several requests from the major producers. We are selling lots of tracts.

One of the major oil companies geologists told me this: "You have just what you say you have."

We are simply dividing up our play on this big undeveloped oil structure by selling you a tract. We use every dollar in developing and drilling right around the tract we sell you. "Close in" means "close in" with us. Not miles away. A "fault" line, means a "fault" line with us and not a hypothetical one. Our geologist says we are on: "One of the largest potential undeveloped structures in Texas."

It takes QUICK ACTION now. We are going right down with this well.
CROWN PETROLEUM COMPANY
703 Dallas National Bank Bldg.,
Dallas, Texas.

320 ACRE LEASE FOR SALE

South half twelve-Twenty-South Thirty Seven-East Lea County, New Mex. Deeded Land. Marland No. 1 Waren drilling near sand three miles North. Wire or write me offer. C. A. Vandagriff, R. 1, Seminole, Okla.

FOR SALE big Mica property near Franklin. Alfred Day, Franklin, N. C.

KANSAS leases in 80 and 160. Good looking proposition. $2.06 acre. For information write F. C. Purdy, Sterling, Kansas.

I WANT bids on 280 acre lease in Arunah, Marshall Surveys 605 and 606, in Brown County, Texas. Now under option to Rio Grande Oil Co., for $100 cash and $150 oil per acre. Bids subject to Rio Grande release and right reserved to reject all bids.

Will sell $7,500. stock interest in $75,000 Company formed to drill 108 acres and give 10 per cent undivided interest in 162 other acres of leases all in Nannie Nichols, B. Appling, A. Appling, Wm. A. Appling, and F. C. Appling tracts in Harriet Cottle Survey, Gander Slough District of Luling Oil Field in Guadalupe County, Texas. Derrick up on Nannie Nichols tract and drilling to begin not later than April 25, 1929. Location by Bertrand Graff. Titles perfect. Stock clear and unassessable. This is big bargain at $7,500. Cash. Act quickly because this offer will not be open long.

Findlay Dome District, Hudspeth County, Texas, looks good. Maps and lease prices for $1.

350 Acres near Moray Dome, Jefferson County, Texas. Lease bonus $100. per acre. Wire or write G. D. Baten, 3604 Louisville St., El Paso, Texas.

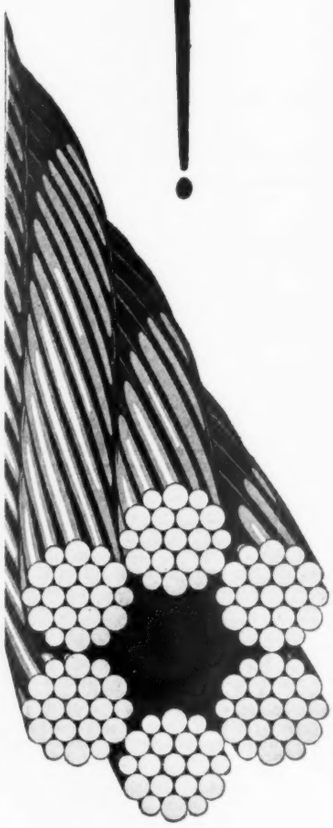
REAL ESTATE

FOR SALE: Sites for filling stations and service shops. Best in Sapulpa, Oklahoma. L. J. Seay, Sapulpa, Okla.

SALE OR LEASE—An all steel building, 70'×200', with one or more acres of land. Electric power, switch and industrial tracks, office, etc. Well located (adjacent to new base ball park), and suitable for any manufacturing business. On a lease basis, will build to meet your requirements. M. R. Ducey, Owner, P. O. Box 223, Houston, Texas.

Additional Classified Wants on Next Page

MACWHYTE
—a strong rope with
long life
!



Write for location of stocks

Macwhyte Company
2916 Fourteenth Avenue
Kenosha, Wisconsin

GROWTH OF GASOLINE INDUSTRY REFLECTED

(Continued from Page 132)

the pressure is read. The absolute vapor pressure is calculated by the following formula: Gauge pressure minus—(Barometer reading, times absolute temperature of the water bath, divided by absolute temperature of the air bomb, minus—barometer reading) equals the absolute vapor pressure.

As mentioned before the Reid method seems to be the most practical at present. However, it does not meet the requirements as a method to supplant the present I.C.C. method, as the results are always lower, due to the excessive evaporation of the lighter components of the gasoline.

In addition to the work being done on the problem of vapor tension, efforts are also being made to devise means of determining the volatility of the mixture of various hydrocarbons that constitute natural gasoline, more accurately than the methods used at present. The results so far indicate that if the sample is taken at tank pressure or if the sample bottle is purged and lowered into the tank containing the gasoline, immediately closed, eliminating any evaporation and thoroughly chilled before opening the bottle, that an Engler distillation properly made and the distillation loss plotted at the lower part of the curve is a much better indicator than the method of plotting the loss at the other end. Also it is very essential that extreme care be exercised in obtaining the sample.

The methods of low temperature fractional distillation of both gases and liquids have developed rapidly and it is possible that in the future a method will be devised that will be adaptable to the routine testing of all gasoline, but for the present the idea of fractionation is too expensive and complicated for general use.

The methods of testing in the future can of course only be surmised as improvements are constantly being developed both in the plants and laboratories so any mention of future methods would be truly probable methods. Perhaps in the future a method of obtaining the true vapor pressure of the gasoline will be devised and a method of distillation that is more adaptable to natural gasoline than the one now in use will be adapted. These together with the gravity and other qualifications such as the doctor test, corrosion, etc., holding in all cases, will be of very material assistance in determining the quality of the product to the satisfaction of both the refiner and manufacturer.

DEATH OF R. B. STONE

Rufus Barret Stone, oil man, attorney at law and publicist, died at his home in Bradford, Pa., Tuesday, March 19, aged 82 years. He went to Bradford in 1876, shortly after the opening of that oil field and began the practice of law, but he also became interested in the oil business and in the course of his long life operated in many fields. He was at one time president of the Conemaugh Gas Co. which company was sold to another corporation. In 1919 he spent several months in Colombia in the interest of the Equatorial Oil Co., tracing boundaries and clearing titles. As an attorney he took part in a number of important law suits. Deceased was a brother of Former Lieut. Gov. Charles W. Stone of Warren, Pa., and George Stone, wealthy lumber man of Seattle, Wash., both deceased.

GERMAN PETROLEUM HANDBOOK

Handbuch der internationalen Petroleum Industrie 1929, compiled by Dr. Oskar Tokayer, has been issued by Finanz-Verlag G.M.B.H., 47 Neue Friedrichstrasse, Berlin.

This book contains, in German, a brief statement of many important companies of the world engaged in the petroleum industry. The data include list of officers, capital, nature of business and earning record.

CLASSIFIED WANTS

(Continued from Preceding Page)

RANCHES AND FARM LANDS

FOR SALE—HUNTING PRESERVE 8,800 acres situated in Southeastern part of South Carolina about 40 miles from the Atlantic Ocean and bordering on two navigable rivers. All kinds of Wild Game, such as Deer, Quail, Turkey, Ducks, Fox, Rabbits and Opossum. Good fishing, boating and bathing. About seven million feet of timber on land. About 2,000 acres in cultivation, which is suitable for growing all kinds of truck, fruit and pecans. W. P. Harley, Box 453, Bowling Green, Ky.

S. E. OKLAHOMA unimproved land bargains; 40 to 1,000-acre tracts in coal, new oil and gas belt; $3 an acre up. John Cavanaugh. McAlester, Okla.

LEA COUNTY, New Mexico. City and Ranch property for sale. Raymond L. Tate, Lovington, New Mexico.

PATENTS

CAPITAL
Inventor of revolutionary cracking process would incorporate to license economical methods to refiners, etc. Prefer those who could take an active interest. The details and model plant will be shown only to those willing to prove their interest. Address Box C-841, The Oil and Gas Journal, Tulsa, Okla.

OKLAHOMA MFG. and SALES CORP. having best of contacts with the oil producing and drilling industry, will buy, market, or finance patents of merit pertaining to the drilling or producing industry. All information strictly confidential. Box C-820, The Oil and Gas Journal, Tulsa, Okla.

PATENT ATTORNEYS

REGISTERED PATENT ATTORNEYS
United States and Canada
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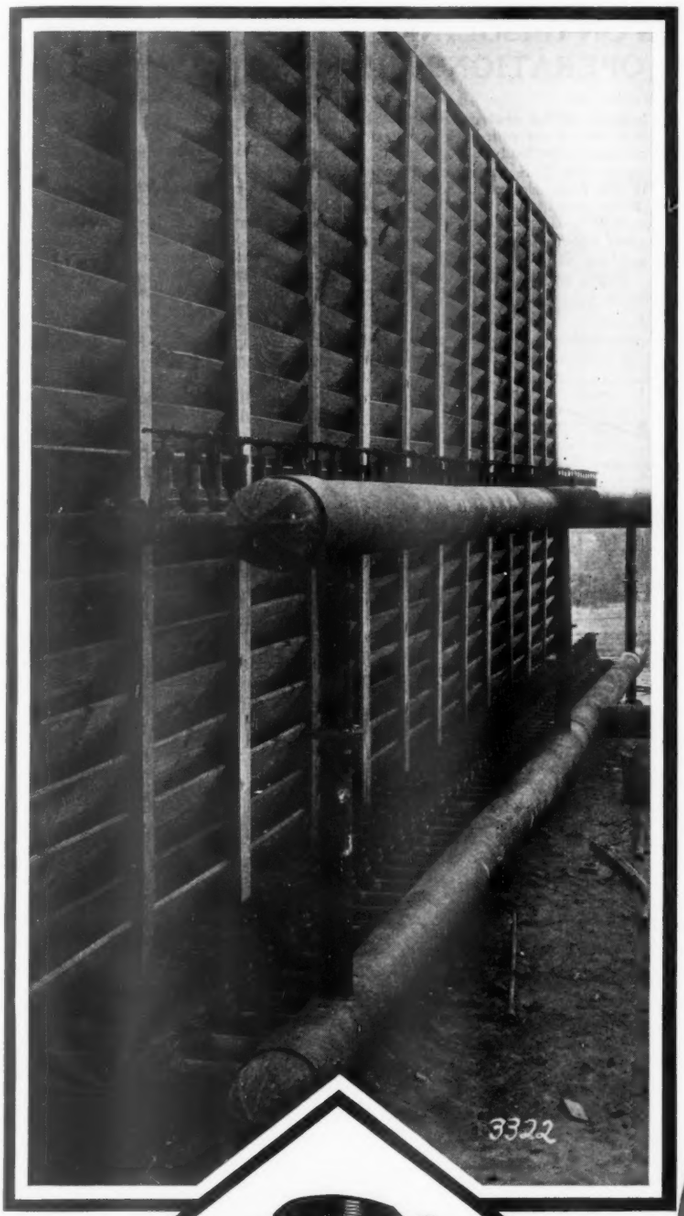
In the line of Duty



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Practical Suggestions in Refining

By W. T. Ziegenhain

GYRO PROCESS SECURES CRACKING PATENT RIGHTS

The Gyro Process Co. has secured the right to offer its licensees rights under all cracking patents owned or controlled by The Texas Company, the Standard Oil Co. of Indiana, the Standard Oil Co. of New Jersey, Gulf Refining Co., and the Gasoline Products Co. in so far as these patents relate to the operation of the Gyro Vapor Phase Cracking Process as developed in the refineries of the Pure Oil Co.

In developing the patent situation surrounding the Gyro process it appeared that many of the inventions owned by the companies referred to above which relate not only to the processing of the oil but also to the character of the product resulting interfered with Gyro's inventions to a major degree.

In consequence, by the completion of this arrangement it has been the aim of each of the contracting parties to permit the Gyro Process Co. to offer its licensees patent protection of a scope sufficient to eradicate entirely any doubt as to either patent validity or title.

It is hoped that the arrangement will stimulate vapor phase cracking and as a result render a service to the industry as a whole in connection with the development of an antidetonating motor fuel of a quality sufficient to permit premium prices. Max B. Miller & Co., Inc., are to continue as representatives for the Gyro process.

Recent Patents

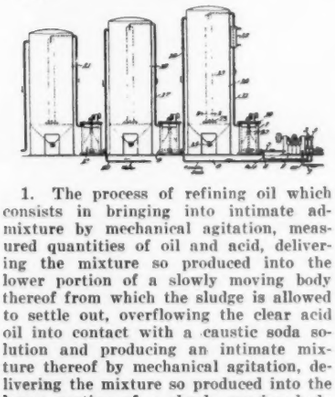
CRACK IN VAPOR PHASE WITH CATALYST

1,702,540. Process for Refining Oil. Eric T. Hessle, Lemont, Ill. Filed March 12, 1926. Serial No. 94,122. 3 Claims. (Cl—196—52.)

1. A process of converting hydrocarbon oils into lower boiling products, which includes directing the oil against a counter current stream of a hydrocarbon vapor under sufficient pressure to form a true fog of highly dispersed liquid oil suspended in said vapor, and passing said fog through a decomposition catalyst whereby decomposition of the oil and vapor take place to form lower boiling products.

DRAW OFF ACID SLUDGE CONTINUOUSLY

1,702,313. Process for Refining Mineral Oils. Alexander S. Ramage, Detroit, Mich., assignor, by mesne assignments, to Gyro Process Co., a corporation of Michigan. Filed November 3, 1924. Serial No. 747,641. 2 Claims. (Cl. 196—38.)



1. The process of refining oil which consists in bringing into intimate admixture by mechanical agitation, measured quantities of oil and acid, delivering the mixture so produced into the lower portion of a slowly moving body thereof from which the sludge is allowed to settle out, overflowing the clear acid oil into contact with a caustic soda solution and producing an intimate mixture thereof by mechanical agitation, delivering the mixture so produced into the lower portion of a slowly moving body thereof and then overflowing the neutralized oil and washing it.

NEW SPECIFICATIONS ON GASOLINE WILL NOT ALTER OPERATIONS MUCH

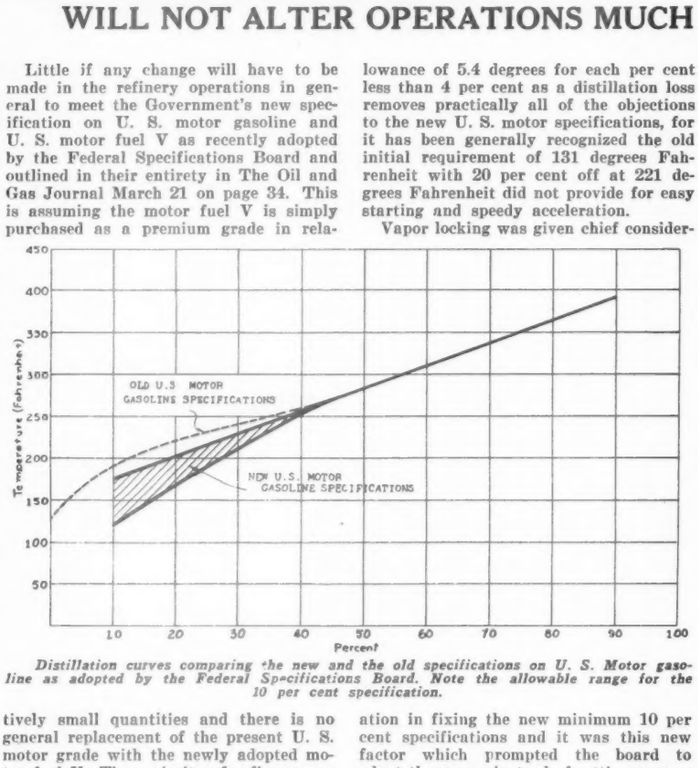
Little if any change will have to be made in the refinery operations in general to meet the Government's new specification on U. S. motor gasoline and U. S. motor fuel V as recently adopted by the Federal Specifications Board and outlined in their entirety in The Oil and Gas Journal March 21 on page 34. This is assuming the motor fuel V is simply purchased as a premium grade in relatively small quantities and there is no general replacement of the present U. S. motor grade with the newly adopted motor fuel V. The majority of refiners now make several standard grades of gasoline, including what is generally termed a 375 endpoint, a 390 and a 400 endpoint gasoline, in addition to the regular U. S. motor. Any gasoline of 400 endpoint or less is usually considered a premium grade.

Similarly, there is a rather loose way of specifying premium grades because there seldom are intermediate specifications demanded. On the other hand, however, these gasolines represent the "cream" of the gasoline in the crude and intermediate specifications are less needed. Because of the 90 per cent specification on the new government motor fuel V being established at 365 degrees Fahrenheit and the 50 per cent at 257 degrees Fahrenheit the new fuel will be near what has been generally termed a 390 endpoint grade. This assumption appears consistent with the present degree of efficiency in fractionation, allowing a spread of from 35 to 40 degrees between the 90 per cent and the endpoint.

Distillation Curves

Below is a distillation curve showing the range under the new U. S. motor specifications and for comparison, the old U. S. motor specifications are shown. The wide difference between the old and the new over the first 50 per cent of the curve shows up very forcefully but in actual practice, the average motor gasoline was considerably better than the U. S. motor specifications and easily fell within the new range as plotted. The allowance of 5.4 degrees for each per cent less than 4 per cent as a distillation loss removes practically all of the objections to the new U. S. motor specifications, for it has been generally recognized the old initial requirement of 131 degrees Fahrenheit with 20 per cent off at 221 degrees Fahrenheit did not provide for easy starting and speedy acceleration.

Vapor locking was given chief consideration in fixing the new minimum 10 per cent specifications and it was this new factor which prompted the board to adopt the range, instead of setting a maximum 10 per cent specification. The wide range allowed does not appear to work a hardship from a refinery operating standpoint and if conclusions may be based on samples collected from 16 filling stations in Tulsa, the range is reasonable. Out of 34 samples of gasoline tested, including 6 premium gasolines and 3 blends of natural gasoline and naphtha all passed and the lowest 10 per cent point was 130 degrees Fahrenheit, while the highest was 168 degrees Fahrenheit. The average of the regular motor grade was 150 degrees Fahrenheit for 1928, 146 degrees Fahrenheit in 1927 and 160 degrees Fahrenheit in 1926.



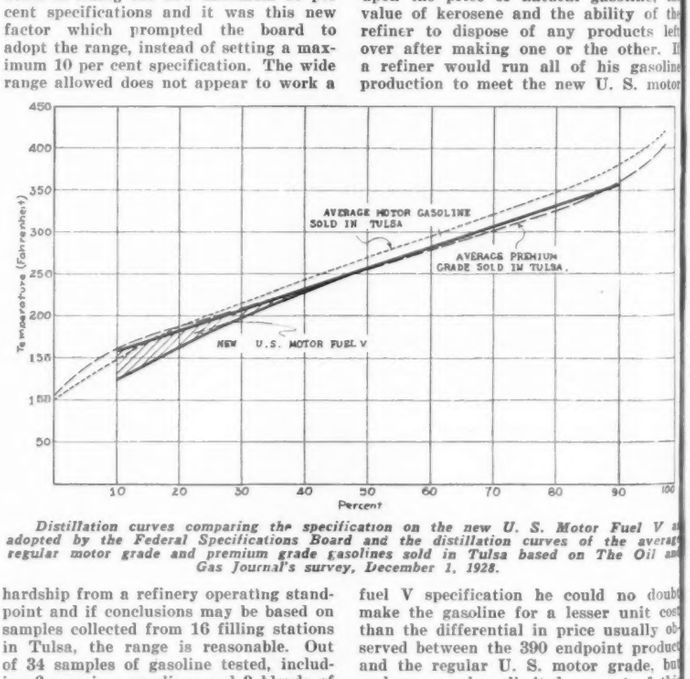
Distillation curves comparing the new and the old specifications on U. S. Motor gasoline as adopted by the Federal Specifications Board. Note the allowable range for the 10 per cent specification.

These tests are based on the results of the annual surveys made by The Oil and Gas Journal in which samples are collected from practically every refiner selling gasoline through company-owned stations in Tulsa. These samples are run impartially and tested by commercial laboratory. The second set of distillation curves includes one of the average motor gasoline last year, the first 10 per cent falling within the limits demanded of the new U. S. motor fuel V grade. Beyond the 10 per cent mark, the curve consistently rises above the U. S. motor fuel V specifications, however, as should be expected.

Curve on Motor Fuel V

On the same set of curves, the range of specifications on the new U. S. motor fuel V is shown and the narrower range covering the 10 per cent point is at once noticeable compared with the U. S. motor grade. For comparison, the average of the samples of premium gasolines was plotted on this curve also and while there is a close relationship between the premium gasoline and the new U. S. motor fuel V, the average of the premium grades would not have passed the government specifications. Thus, if any one expects to purchase the new grade of gasoline he in turn should expect to pay more for it.

What this differential should be varies among refiners and is dependent largely upon the price of natural gasoline, the value of kerosene and the ability of the refiner to dispose of any products left over after making one or the other. If a refiner would run all of his gasoline production to meet the new U. S. motor fuel V specification he could no doubt make the gasoline for a lesser unit cost than the differential in price usually observed between the 390 endpoint product and the regular U. S. motor grade, but so long as only a limited amount of this gasoline is made, the unit cost of making it along with the regular U. S. Motor grade is high.


AVERAGE MOTOR GASOLINE SOLD IN TULSA
AVERAGE PREMIUM GRADE SOLD IN TULSA.
NEW U.S. MOTOR FUEL V
Temperature (Fahrenheit)
Percent

Distillation curves comparing the specification on the new U. S. Motor Fuel V as adopted by the Federal Specifications Board and the distillation curves of the average regular motor grade and premium grade gasolines sold in Tulsa based on The Oil and Gas Journal's survey, December 1, 1928.

Natural Gasoline a Factor

The present cost of natural gasoline will probably fall close to 9 cents delivered into an Oklahoma refinery. Aside from the evaporation loss on the material after it is received at the plant and during blending and reloading, there is an additional cost as a handling charge. Its value to the refiner lies in the fact he can cut deeper into the crude and by bal

SUMMARY OF NEW GOVERNMENT GASOLINE SPECIFICATIONS

Distillation range—	U. S. motor gasoline	U. S. motor fuel V
10 per cent over at	*122-176° F.	*122°-158° F.
50 per cent over at	284° F. maximum	257° F. maximum
90 per cent over at	392° F. maximum	356° F. maximum

*For each per cent less than 4 per cent distillation loss the minimum requirement on the 10 per cent point may be lowered 5.4 per cent Fahrenheit. Thus if a sample of gasoline showed a distillation loss of but 2 per cent the lower limit will be changed from 122 degrees Fahrenheit to 111.2 degrees Fahrenheit. The Government reserves the right, however, to raise the lower limit on the U. S. motor gasoline to 140 degrees Fahrenheit with the same correction for loss when purchasing for storage or special uses in tropical regions.

Loss—At least 95 per cent shall be recovered as distillate in the receiver for both grades.

Sulphur—Not over .1 per cent sulphur for both grades.

Corrosion—Clean copper strip will not show more than extremely slight discoloration at 122 degrees Fahrenheit for three hours.

ancing the heavier fractions with a certain percentage of natural gasoline he is able to make satisfactory motor fuel. Thus he is able to convert a part of what would go to make a kerosene into a very satisfactory gasoline. This is an old story and this development has been apparent for many years, but if there is a continued demand for low endpoint gasolines, this trend will be reversed.

Coming back to the matter of costs, it is entirely possible that the cost of using natural gasoline can reach a point where it will pay the refiner to take a lesser yield from his crude oil and make a 60-62 gravity 390 endpoint gasoline requiring little or no natural gasoline than to make a larger yield of the regular 58-60 U. S. motor grade requiring from 8 to 15 per cent natural gasoline. One refiner is able to make a cut of naphtha from Seminole crude that goes into his 58-60 U. S. motor gasoline that has a gravity of 48. To blend this fraction up to 58.5 gravity, 31 per cent natural gasoline is used. This does not mean the practice of using natural gasoline is not profitable but the facts are presented here simply to show what enters into the matter of costs. Similarly, as kerosene prices approach the U. S. motor gasoline price, there is less desire to make a sharp division between the gasoline and kerosene.

KEROSENE TANK WAGON ADVANCE HELPS MARKET

(Continued from Page 135)

parison with some previous seasons. The demand for heating or furnace oils was very largely on these gravities and this demand is disappearing although there will be some used for several weeks yet but not in such quantities. Some of these high grade fuels are also usable for cracking stock by systems that require a prepared oil, usually, a gas oil. The industrial demand is large, the steel mills being very large consumers. At the prices for fuel oil there is no reason why any furnace that is equipped to use oil should be fired with coal. A good industrial demand for fuel oil is assured for some months and while the consumption of the heating plants will be missed there is a certainty of a good movement of fuel oil. Many of the larger industries have contracts as have the railroads, so that the larger part of the deliveries will be on these contracts, but the month-to-month buyers will be substantial users of fuel oil. In fact the inquiries for April deliveries have been unusually early. Prices are steady except for the gradual disappearance of the premiums for a low cold test. The fuel oils that are free from sulphur in excess and with a fair to low viscosity are firmly held and even the high sulphur oils are holding their own. As a matter of fact fuel oils are cheap at the present market and with a good demand, only the undesirable oils will favor the buyers in price.

Motor Oils

Motor oils are being sold in large quantities to the jobbers right now as the latter are preparing for the coming spring demand. The movement has been going on for some time but is becoming more general. Bright stocks are a little more firmly held, steam refined stocks unchanged but firm with neutrals still easy. The general demand outside of the motor oils is good and many industries are using more than their average quantities of lub oils.

Tank Wagon Prices

The advance in the tank wagon prices on kerosene which was announced for the Standard Oil Co. of Indiana territory as effective Saturday, March 23, did not come as an entire surprise to the trade. This brings the tank wagon on kerosene very close to the tank wagon on gasoline. At Chicago there is now but 1 cent difference and much the same condition prevails in other parts of the territory. There are many oil men who feel the remedy for this small margin between these two commodity prices will be an advance in the gasoline tank wagon and may be looked for as soon as the tank car market shows a little more strength and somewhat higher prices. This is not a prediction but the expression of many in the trade. There are a number of differences in ruling conditions. The kerosene season is short, the quantity sold limited and the supply is small and decreasing. Gasoline is just beginning its season which has months to run, the supply is larger, the refining facilities very ample and a too early advance in the gasoline tank wagon might be an inducement for excessive operations by refiners or for the starting of plants that are idle. But this much is certain, the advance in the kerosene tank wagon is not without its influence on the gasoline market.

CHANGE FOR BETTER EXPECTED IN THE EAST

(Continued from Page 134)

market at 75 cents. A local operator was in the market this week with an inquiry for 35,000 bbls. out of the Gulf, and could not beat 72 cents. One of the large refiners, normally a leading fuel oil marketer, when approached on the 35,000-bbl. inquiry, declared it had no surplus stocks of bunker "C" available for spot trading.

Export kerosene prices are higher both here and at the Gulf. The market is held at 7¾ cents for prime white and 8¾ cents for water white at the Gulf, and a quarter cent per gallon higher in each instance at North Atlantic export terminals.

Foreign demand for lubricating oils has been a market feature, and has been instrumental in bringing about further gains in cylinder oil stocks. A good deal of the current buying is being done for the account of British marketers, but more inquiry is beginning to reach sellers from the Continent and from South American markets.

There has been little change in the export situation on other refined products this week.

Petroleum Exports

The following table shows principal exports of petroleum and refined petroleum products from New York during the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Mar. 16	Mar. 9	Mar. 2
Gasoline	745,000	103,800	435,000
Naphtha	656,800	267,000	840,000
Kerosene	103,000	102,600	215,000
Fuel oil	7,100	8,700	84,800
Lub. oil	3,867,900	3,140,600	1,500,700
Petroleum, ref.	3,255,000	756,500	783,000
	Pounds		
Petrolatum	32,000	.....	.....
Paraffin wax	1,456,500	2,927,000	2,914,800
Scale	490,000	756,000	122,300
Lub. grease	1,201,500	760,800	1,405,000

Steady increase in export demand for refined petroleum was a feature of the week. Exports for the week ended March 16 were more than double the total export shipments of the same classification in the previous fortnight. Gasoline and naphtha exports were also much larger, while foreign inquiry for lubricating oil and lubricating greases showed gains.

Imports

Imports of crude and refined oils at the principal United States ports for the week ended March 16 totaled 1,771,000 bbls., a daily average of 253,000 bbls., compared with 2,010,000 bbls., a daily average of 287,143 bbls. for the week ended March 9 and a daily average of 252,786 bbls. for the four weeks ended March 16. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	
Baltimore	62,000
Boston	70,000
New York	1,042,000
Philadelphia	386,000
Total	1,560,000
Daily average	222,857
At Gulf Coast Ports—	
N. Orleans, Baton Rouge	211,000
Daily average	30,143
At all United States Ports—	
Total	1,771,000
Daily average	253,000
Daily average four weeks	252,786

California Oil Receipts

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended March 16 totaled 225,000 bbls., a daily average of 32,143 bbls., against 437,000 bbls., a daily average of 62,429 bbls. for the week ended March 9 and a daily average of 61,964 bbls. for the four weeks ended March 16. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	
New York	145,000
Philadelphia	80,000
Total	225,000
Daily average	32,143
Daily average four weeks	61,964

There were no arrivals of California oil at Gulf ports for the week.

Distribution of total California oil receipts is as follows: Gasoline, 225,000.

Little interest in California gasoline is shown by the East Coast trade this week, and no large contracts are reported.

LOUISIANA-ARKANSAS

(Continued from Page 50)

up with hydraulic machine to resume work on No. 92 Dillon, Section 13-21-15, total depth 6,009 feet. C. H. French set 100 feet of 10-inch and is drilling at 400 feet on No. 5 Muslow, Section 31-21-15.

LaSalle Parish

Urania—Kinney and others' No. 1 Kinney, Section 7-10-2e, made a drill stem test at 619 feet, got a small show of gas and shut down for orders. Randall and others had a small show of gas at 675 feet and are arranging to plug back and perforate on No. 3 Urania, Section 1-10-1e. G. W. Zoder has location 600 feet north and 150 feet west SE cor. NE, Section 13-10-1e, for No. 1 M. H. King.

Monroe District

Morehouse—Interstate Gas Co. set 187 feet of 12½-inch casing on No. 1 Crowder-Moore, Section 31-21-15. Southern Carbon Co.'s No. 2 Miles, Section 1-20-4, is drilling at 2,050 feet and No. 9 Tensas, Section 2-20-4, at 1,300 feet.

Ouachita Parish—Magnolia Petroleum Co. has derrick up for No. 2 United States, Section 30-19-5. Maury Drilling Co.'s No. 5 McEwen, Section 29-19-4, is making hole at 500 feet. Ouachita Natural Gas Co. is drilling shale and boulders at 1,608 feet on No. 1 Sandidge Patton, Section 15-20-4. Palmer Corp.'s No. 6 fee, Section 24-19-4, is shut down at 2,066 feet repairing rig. Peerless Carbon Co. cemented 6-inch at 2,123 feet on No. 4 Moore, Section 26-20-4. United Carbon Co.'s No. 1 Spade, Section 36-19-3, cemented 12-inch at 196 feet and 8-inch at 788 feet; No. 1 Arent, Section 14-19-3, is a rig.

Union Parish—Industrial Gas Co. set 876 feet of 8-inch and is drilling at 1,800 feet on No. 1 Cook, Section 12-20-3. Imperial Oil & Gas Products Co.'s No. 1 Stripling, Section 8-20-4, cemented 8-inch at 797 feet and 6¼-inch at 2,096 feet.

Red River Parish

Bull Bayou—C. H. Tuttle's No. 1 fee, Section 17-13-10, set 101 feet of 10-inch and is drilling at 900 feet.

Richland Parish

Carbon Gas Co. is sidetracking drill stem in No. 1 W. T. Sartor, Section 16-16-6, total depth 2,361 feet. Magonlia Petroleum Co.'s No. 1 Noble, Section 36-16-5, set 914 feet of 10-inch for second string; No. 1 Sartor, Co., Section 5-15-6, is a rig. Northern Louisiana Natural Gas Co.'s No. 1 Hemler, Section 22-16-6, cemented 6-inch at 2,314 feet.

Webster Parish

Cotton Valley—Louisiana Oil Refining Corp. made location 660 feet south and 530 feet east NW cor. SW NE, Section 28-21-10, for No. 3 Nelson. Magnolia Petroleum Co. cemented 8⅛-inch casing at 4,400 feet on No. 4 Ira Cox, Section 23-21-10, and is running 10¾-inch on No. 6 Marshall, Section 21-21-10, total depth 3,503 feet; No. 1 McCook & Hibbler, Section 22-21-10, tested 300,000 feet of gas at 4,722 feet and lost core barrel.

Sarepta and Shongaloo—Pat Hudson is drilling No. 1 Slack, Section 1-22-11, at 1,860 feet. Magnolia Petroleum Co.'s No. 1 Adkins, Section 4-22-9, is a rig and No. 1 Cook, Section 2-22-11, is reaming to bottom, total depth 2,710 feet; No. 1 Denman, Section 1-22-11, tested salt water with a show of oil and gas at 2,719 feet. Nemours Corp. got 2,000,000 feet of gas in 3 feet of sand on No. 1 Munn, Section 1-22-10, and shut down for orders, total depth 2,623 feet.

ARKANSAS

Johnson County

Arkansas-Louisiana Pipe Line Co. (Arkansas Natural Gas Corp.) is drilling 10-inch plug on No. 2 Bynum, Section 12-10-24, total depth 2,300 feet.

Ouachita County

Smackover—Gulf Refining Co. is drilling No. 8 Goodwin, Section 32-15-15, at 2,608 feet.

Stephens—Louisiana Oil Refining Co. found the top of the red beds at 2,535 feet on No. 1 Manly, Section 15-15-19, and is coring at 2,646 feet.

Union County

Champagnolle—Arkansas Natural Gas Corp. has rig up for No. 1 Morris in Section 7-17-13. Lion Oil Refining Co. is arranging for a drill stem test of sand from 2,751-53 feet on No. 2 Kelly, Section 9-17-14, total depth 2,755 feet. Ohio Oil Co. has rig up for No. 2 Raulston, 330 feet south and 310 feet west NE cor. SE SE Section 12-17-14, and for No. 1 Oliver, 313 feet south and east NW cor. SW SE, Section 7-17-13. Oilwell Corp. is coring No. 1-D Perdue, Section 9-17-14, at 2,785 feet. Rovenger Oil Corp. had salt water sand from 3,400-03 feet and is arranging for another drill stem test at 3,437-41 feet. Skelly Oil Co.'s No. 2 Kelly, Section 9-17-14, has 6,000,000 feet of gas with a spray of oil at 2,830 feet and has cemented 8½-inch at 2,791 feet for a test.

El Dorado—Gulf Refining Co.'s No. 1 Cook, Section 1-18-15, set 10-inch at 484 feet and is drilling at 1,194 feet.

Smackover—Hollifield & McAlphin's No. 18 Giller, 400 feet south and west NE cor. NE SE, Section 10-16-15, set 66 feet of 10-inch and are drilling at 1,800 feet. Lovell and others got salt water on a drill stem test of No. 1 Goodwin & Stone, Section 3-16-16, at 2,381-87 feet and are drilling at 2,460 feet. Sam Richardson is running sand pump on No. 7 Lawton, Section 10-16-15, total depth 2,087 feet.

EAST TEXAS

Harrison County

Nick Barbare is fishing for bit and collar in No. 1-A Bahan-Furrh, James Short Survey, total depth 2,324 feet. Eureka Natural Gas Corp.'s No. 1 Timmons, in the R. W. Bedford Survey, cemented 6-inch at 2,288 feet.

Panola County

Adams & Walker set 10-inch at 60 feet and are drilling at 780 feet on No. 1 Adams in the Elijah Johnes Survey. H. H. Alvord set 10-inch at 100 feet on No. 1 Floyd, B. C. Jordan Survey, and has a fishing job at 980 feet. Eureka Natural Gas Co. is drilling No. 3 Gully, James Matthews Survey, at 1,511 feet and No. 4 at 450 feet with 10-inch set at 100 feet. Magnolia Petroleum Co. got 40 feet of salt water in the drill stem on testing No. 3 T. C. Adams, James Matthews Survey, at 997 feet and is coring at 1,043 feet; No. 3 Ella Baker, B. C. Jordan Survey, is coring at 2,618 feet and No. 3 Lula Fletcher is in shale at 1,350 feet; No. 15 Steele cored hard shale at 2,647 feet. The Texas Company is drilling around 100 feet on No. 9-A T. C. Adams in the Thomas Cox headright.

OIL TAX BILLS IN LOUISIANA

SHREVEPORT, La., Mar. 25.—Shortly after the United States Supreme Court issued a ruling in behalf of the plaintiff in Ohio Oil Co.'e test suit of the Louisiana severance tax law in 1928 Governor Huey P. Long called a special session of the legislature for the purpose, among other things, of correcting a defect in the law to which the court called attention. Also included in the objects was the enactment of a law applying an occupation license tax of 5 cents per barrel on all refined oils. It is believed the proposed tax has very little chance of being imposed. Such is true, also, of the proposed tax of one and a half cents per pound on carbon black, three times the present levy.

Brief Items for Petroleum Refiners

MADE VICE PRESIDENT OF BURFORD OIL CO.

John J. Thomas, who has been general superintendent of the Burford Oil Co. for several months, has been elected a vice-president of the company.

Mr. Thomas has been engaged in engineering work connected with refinery and natural gasoline plant construction and

John J. Thomas

operation for several years. He was formerly with the Skelly Oil Co. Later he was refinery superintendent for the Crystal Oil Refining Corp. at Shreveport, La.

When the Burford Oil Co. was organized last year, Mr. Thomas was placed in charge of construction of the 6,000-bbl. refinery which was recently completed at Pecos, Tex. He will continue as general superintendent of the refinery.

OIL TRADES OFFICERS

NEW YORK, Mar. 23. — Phillip C. Meon, of the Borne-Scrymser Co., has been elected president of the Oil Trades Association of New York at the annual business meeting held at the Waldorf-Astoria. Mr. Meon succeeds T. J. Skidmore of the Tide Water Oil Co. Mr. Skidmore had been ill for some time and was not present at the meeting.

In a short address to the members, the new president asked for the support of the members and officers. Besides Mr. Meon, the new officers are as follows: Vice president, A. A. Hoffman, of the American Oil & Supply Co.; secretary, Joseph C. Smith, of the Smith-Weihman Co.; treasurer, George Suraud, Chelsea Oil & Supply Co.

TO LOWER RATES

The Montana State Railroad Commission has issued an order which will materially reduce rail rates on shipments from Montana refineries to intrastate points. The reduction will amount to as much as 30 per cent in the case of gasoline. The Montana refiners for several years have endeavored to secure lower freight rates, contending that refiners outside the State have an advantage in shipments to points within the State.

NEW PLANT AT CISCO

The Superior Refining Co. is constructing a 500-bbl. capacity plant at Cisco, Tex., on the site of the old Pioneer Oil & Refining Co. It is expected to be in operation April 15.

SPRING MEETING OF I.O.M.A. ELECTS NEW DIRECTORS AND HEARS REPORTS

CHICAGO, Mar. 26.—At a meeting of the new board of directors of the Independent Oil Men of America held here today in connection with the spring meeting, Col. E. R. Hilpp of the Kentucky Consumers Oil Co., Louisville, Ky., was re-elected president of the association. C. L. Maguire of the Northland Oil Co., Chicago, was re-elected chairman of the board of directors. C. S. Rosenthal of Chicago was elected vice president and Paul U. Deer, secretary and treasurer.

C. Y. Hinchey, who has been acting manager of the association for several months, was elected executive manager. Miss Helen Schroeter was elected assistant secretary. No action was taken on the proposed merger of the association with the American Oil Men's Association, although the matter was discussed at the meeting of the board.

The election committee reported the names of 10 members of the board of directors to succeed the one-third who retire each year. The new members are C. E. Rennie, K. A. Buck, Dean Kimmel, R. C. Clark and J. C. Nourse.

At its first meeting the new board of directors filled three vacancies, electing I. A. Archambault, W. R. McGain and Paul U. Deer. D. Pierce and Al Lommel were re-elected trustees.

At the morning session of the second day the new officers and directors were introduced to the members and made brief addresses. Jay Trexler, manager of the Red Hat Motor Oil Department, talked to the members reviewing the progress made. He stated that during the second year of the department sales of motor oils under their brand increased two and one-half times. During the first three months of the current year that ratio of increase has been held.

A number of oil men spoke of the benefits they had received from membership and urged the members to be more active in making the organization the outstanding independent oil association. One of the most enthusiastic supporters of the organization was Mr. Hudson of the Marine Oil Co. of New Orleans.

The afternoon meeting was largely devoted to hearing a talk by Henry Bussey Floyd, the association's patent attorney, who told the members of the present standing of the Red Hat brand. Other talks were made by members on the present and future position of the oil industry and the place which the organization had made and could make in the industry. Several expressions were made of the interest shown by oil men in attending in such numbers what was purely a business conference of members and not a convention.

PURCHASES CONTROL OF VALVALINE OIL COMPANY

NEW YORK, Mar. 23. — A banking group, reputedly acting for a large oil company, has purchased control of the Valvoline Oil Co., it is reliably reported here.

Valvoline is one of the oldest independents in the East Coast area, and has long been an important factor in the lubricating oil business. The company has plants at Warren, Pa., and East Butler, Pa., and also has a plant at Edgewater, N. J., just across the Hudson from New York City.

The company owns about 1,500 miles of pipe lines in Western Pennsylvania, northern West Virginia, and southeastern Ohio. Close to 70 branch offices are maintained in the United States, and 24 in Great Britain, where Valvoline's products have wide distribution.

Outstanding capital of the company aggregated $4,213,800. Assets as of December 31, 1927, were $11,015,938.

DIES FROM BURNS

John H. O'Neill, stillman for the Shreveport Producing & Refining Co., at its Jewella (Shreveport) plant, died March 18 from burns received in a gas explosion in the plant's locker room two days before in which A. B. Nell, another employe, was also burned. Nell is expected to recover. Source of the escaping gas which accumulated in the dressing room and how it became ignited, was not determined.

START NEW REFINERY

The Amarillo Producers & Refiners Corp. has started operating its new refinery at Del Rio in West Texas. The refinery has a skimming capacity of 2,500 bbls. daily. The company for some time has operated a refinery at Pecos, Tex. A refinery located at Borger, Tex., was recently dismantled and part of the equipment moved to the Del Rio and Pecos plants.

EVEREST WILL RETIRE AS VACUUM DIRECTOR APR. 1

NEW YORK, Mar. 23.—The name of Everest, continuously associated with the Vacuum Oil Co. since its organization 63 years ago, will disappear from the company's directorate March 31, with the resignation of Raymond W. Everest from the board. Mr. Everest, who has been a director of the company since 1912, is the son of C. M. Everest, former president of Vacuum, and a grandson of Hiram B. Everest, founder of the company.

G. P. Whaley, president of the company, announcing Mr. Everest's resignation, says Mr. Everest's decision to retire has been taken in the interest of his health. Mr. Everest will be succeeded on the board by C. W. Hadley. Mr. Everest has been in charge of production and refining departments of the company and Mr. Hadley is next in line for supervision of these branches. Mr. Hadley is now chairman of the manufacturing committee of Vacuum Oil Co. He has been with the company for more than 39 years, and during the past 18 years has been closely associated with Mr. Everest in the direction of manufacturing operations.

PRUDENTIAL BUYS STATIONS

The Prudential Oil Corp., which was recently purchased by the Marland Oil Co., has purchased the National Oil Co., Inc., of Richmond, Va., and is making plans for the further extension of marketing facilities in the Southern States. The National company has bulk and service stations in Virginia and Baltimore where the Prudential refinery is located. The Prudential will build additional stations in Virginia and in North Carolina and South Carolina.

Practically all of the improvements at the Prudential refinery have been completed and the refinery has been operating for several weeks with West Texas crude oil. The refinery has a rated capacity of 10,000 bbls. daily.

HOMER H. JOHNSON DIES SUDDENLY AT CHICAGO

Oil men throughout the entire industry were greatly shocked Thursday, March 21, when announcement was made of the sudden death of Homer H. Johnson, president of the Johnson Oil Refining Co., Chicago. Mr. Johnson came to his office Thursday morning apparently enjoying the best of health. He was stricken with heart attacks and died Thursday afternoon.

At the time of his death Mr. Johnson was president and the active head of the Johnson Oil Refining Co., an independent producing, refining and marketing company which was organized in 1909. Mr. Johnson became president in 1920 and since that time it has grown from a $400,000 concern to $6,000,000.

Mr. Johnson was born at Harrison Valley, Pa., in 1883. He graduated from a military school at Peekskill, N. Y., and was a member of the class of 1906, Princeton University. He was engaged in several enterprises before entering the oil business. He was secretary and treasurer of the Central Refining Co., later purchased by the Indian Refining Co.

Mr. Johnson's home was at Kenilworth, Ill., a suburb of Chicago. He is survived by his widow and six children. His mother, three sisters and three brothers also survive. Funeral services were held Saturday, March 23, at the Memorial Park Cemetery Chapel, Evanston, Ill.

ENLARGE SUN REFINERY

TOLEDO, Ohio, Mar. 23.—The Sun Oil Co., which operates a refinery here, has purchased 50 acres of land and added it to its plant site. The company will build two 80,000-bbl. storage tanks. The company recently completed the construction of nine 55,000-bbl. tanks. The site now comprises 180 acres. The Sun company has been steadily improving and enlarging its refinery here. It now has a capacity of 12,000 bbls. daily.

DALLAS PRICES LOWERED

DALLAS, Tex., Mar. 23.—A price war appeared to be under way in Dallas this week when retail gasoline prices were reduced from 20 to 17 cents. The Gulf Refining Co. made the reduction and was quickly followed by other companies. The price includes a 2-cent State gasoline tax.

OPPOSE OCCUPATIONAL TAX

SHREVEPORT, La., Mar. 23.—Refiners in Louisiana are strongly opposing the occupational tax which has been proposed by Governor Long. The latter, who has been unfriendly to the oil interests of the State in many matters, is fostering a tax which refiners claim would force the removal of the plants.

VIRGINIA MEETING

The spring meeting of the Virginia Independent Oil Men's Association will be held at Richmond, Va., May 15 and 16. P. S. Ford of Martinsville, Va., is president of the association and M. B. Whiting of Clifton Forge, Va., is secretary.

TWO MEN KILLED

PHILADELPHIA, Pa., Mar. 21.—James McAbee, Jr., and Joseph C. Bennett, employes of the Sun Oil Co., were killed when a still exploded at the Marcus Hook refinery of the company. Three other employes were injured.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

SHERARDIZING PROCESS FOR PROTECTING IRON

Will you please furnish information as to what is sherardized iron and if possible, give a description of the process for making it?—C. T. I.

The sherardizing process is a method for applying a coating of zinc to iron which was developed by Sherard Cowper-Coles, and according to the proceedings of The American Society for Testing Materials, Vol. 24, part 1, page 775, 1925, was discovered about 1900. The process involves rotating the thoroughly cleaned article in drums which are filled with zinc dust. The drums are rotated for approximately four hours in a furnace where the temperature is close to 700 degrees Fahrenheit. During this treatment an alloy of three parts zinc and one part iron, atomic proportions, forms on the surface of the iron; then the proportion of zinc increases toward the surface, where it is practically pure zinc.

The character and thickness of the coating may be varied by control of temperature, time of the treatment, and the quality of the zinc used. The coating of zinc cannot be obtained so thick by this process as by the hot dip process, without the possiblity of flaking. Thick coatings should be avoided in this, as in other methods, when the material must stand bending. The thickness of the coat usually varies from 0.008 to 0.0015 inch.

A large quantity of pipe is sherardized for electric conduits, which are usually protected with an outer coating of paraffin, asphalt, etc.

The process is being applied with the use of other metals than zinc.

FORMALDEHYDE A PRODUCT OF COMBUSTION

On several occasions I have noticed a strong odor of aldehyde around our stills which are fired partly with natural gas and the rest with fuel oil. Is this a usual product of combustion of the hydrocarbons or must some special condition exist?—F. L. C.

Formaldehyde may be produced when natural gas or fuel oil is burned without enough air but the chances are more favorable for its formation from the methane in natural gas than from products of the partial combustion of fuel oil.

An interesting account of the several substances that may be prepared from natural gas is given by Nash and Stanley, The Possible Chemical Utilization of Methane with Special Reference to Natural Gas, in Fuel in Science and Practice, Vol. 7, page 397, 128. They give the following about the oxidation of methane.

For many years it has been known that one of the products of the incomplete oxidation of methane is that very valuable substance, formaldehyde. Formaldehyde is used extensively in the production of important dyes, artificial resins, and intermediate products, and as a disinfectant, deodorizer and antiseptic.

The patent literature on methane oxidation is very extensive, but no successful industrial process appears to have been evolved so far. In general, the processes suggested involve the passage of a mixture of methane and oxygen, or air, over a catalyst such as copper, nickel, cobalt or iron, at a temperature of 500-600 degrees Centigrade. On the other hand, the work of Wheeler and Blair (J.S.C.I., 1923, 42, 8IT) indicates that the presence of a catalyst lowers the yield of formaldehyde. These workers found that, using methane-oxygen mixtures, the yield of formaldehyde varied inversely as the temperature and duration of heating, and that for shorter periods of heating, equimolecular mixtures of methane and oxygen gave the best yield of formaldehyde.

In a recent report of the Department of Scientific and Industrial Research (Ledbury and Blair, "The Production of Formaldehyde by Oxidation of Hydrocarbons," Special Report No. 1), the conclusion is reached that the oxidation of methane on a technical scale for the manufacture of formaldehyde can only be considered economic providing the methane is obtainable in quantity at a low or even nominal cost. Assuming oxygen to be obtainable at $1.25 per 1,000 cubic feet and excluding the cost of methane, the cost of manufacture of 1 ton of formalin by this process is stated to be $185.

It may be confidently expected, however, that the time is not far distant when a satisfactory process for the manufacture of formaldehyde from methane, capable of competing with the existing methyl alcohol oxidation process, will be perfected.

PURIFYING CARBON DIOXIDE GAS

What is the best method of purifying carbon dioxide gas under pressure for the purpose of recovering purified liquid carbon dioxide? The gas is produced at well head between 800 and 960 pounds. The problem is to clean the gas without losing the pressure so that the purified gas can be easily liquefied.—R. A. C.

In addition to the question the further information is submitted showing the analysis of the gas as follows:

	Per Cent Volume
Carbon dioxide	95.3
Methane	2.1
Ethane	2.4
Hydrogen sulphide	trace
Oxygen	trace

There is a small quantity of higher hydrocarbon vapor present which gives the gas a marked gasoline odor. The density compared with air is 1.481.

A problem of this kind cannot be solved without experimental research. It appears that some kind of washing and filtering will have to be done before the gas is reduced to the liquid condition. It would be natural to suggest that the well pressure may be utilized for the liquefying process. You should engage a capable gas chemist for this work.

See the answer to a related question on this page March 14, 1929, Removing Carbon Dioxide from Natural Gas, by J. W. W.

NATURAL GASOLINE IN TANK CARS

What is the standard temperature upon which the volume of natural gasoline required to fill an insulated tank car of a given shell capacity is determined? Is a car loaded to capacity with natural gasoline having a temperature say 40 degrees Fahrenheit when an outage is left in the shell the volume of which is equivalent to the increase in volume when loaded and corrected by the proper co-efficient of expansion for 60 degrees Fahrenheit?—H. H. H.

Natural gasoline or any other product may be loaded into a tank car at a temperature below 60 degrees and allowance made in the shell for the volume which the liquid would occupy at 60 degrees. I may add the additional information below, which is from Rule 405, Agent B. W. Dunn's Tariff No. 1, I. C. C. No. 1.

"Packages containing inflammable liquids must not be entirely filled. Sufficient interior space must be left vacant to prevent leakage or distortion of containers due to the expansion of the contents from increase of temperature during transit.

The proper vacant space or outage in a tank car or other shipping container depends on the co-efficient of expansion of the liquid and the maximum increase of temperature to which it will be subjected in transit. Outage must be calculated to the total capacity of the container.

In tank cars outage must be calculated to percentage of the total capacity of the tank; i. e., shell and dome capacity combined. If the dome of the tank car does not provide sufficient outage, then vacant space must be left in the shell to make up the required outage.

The outage for tank cars must not be less than 2 per cent.

1. An outage of 2 per cent is frequently insufficient for light petroleum or casinghead products, owing to the fact that they expand more than heavier petroleum products when the temperature increases, and this rate of expansion varies with the specific gravity of the material. It is recommended therefore that when uninsulated tank cars are loaded with gasoline, naptha, or casinghead condensates or blende (see paragraph 412 (c) the outage in the tank shall not be less than as shown by the following chart:

Note: The following co-efficients of expansion, per degree Fahrenheit, of the principal inflammable liquids will be used in determining outages:

Gasoline or Naptha

50-55 degrees A. P. I.*	0.00055
55.1-60 degrees A. P. I.*	.00060
60.1-65 degrees A. P. I.*	.00065
65.1-70 degrees A. P. I.*	.00070
70.1-75 degrees A. P. I.*	.00075
75.1-80 degrees A. P. I.*	.00080
80.1-85 degrees A. P. I.*	.00085
85.1-90 degrees A. P. I.*	.00090

*Degrees A. P. I. (American Petroleum Institute), according to the following formula:

$$\text{Degree A .P. I.} = \frac{141.5}{\text{Specific Gravity}} - 131.5$$

MOISTURE COLLECTING IN TANK CARS

Please advise us concerning the possibility of moisture collecting in tank cars in transit due to frosting, sweating, etc. Any information given along this line will be appreciated very much.—E. G. G.

The condensation of moisture on the inside of a tank will occur under a favorable condtion. This, is based on the quantity of water contained in the atmosphere, the common example of which is that frequently observed when a vessel containing a comparatively cold liquid, such as ice-water, is permitted to stand for some time; then, if the air is still, there will soon be noticed beads of water collecting on the outside of the vessel.

The vapor enters into the composition of the atmosphere in varying proportions and when it contains all the water it can hold, it is said to be saturated. The quantity that it is capable of holding increases with the raising of the temperature and decreases when the temperature is lowered. This does not mean that the quantity of water is fixed by the temperature only that this covers the condition of saturation. Under average conditions the atmospheric air is not saturated with water, and it may contain different quantities at different temperatures and different quantities at the same temperature.

Because of these facts the opinion is often expressed that appreciable quantities of water may collect in a tank car because the product was loaded at a higher temperature than the temperature existing at the time and point of delivery. There is little foundation for this suggestion; because, there is not enough air enclosed in the car with the product to permit an appreciable quantity of water to be precipitated even if the most favorable conditions existed. A tank car is supposed to be loaded shell full and then the only air present would be the trace that might be present in the vapor held in the dome. The quantity of water held in this way could not be detected by ordinary means.

Under conditions of saturation at 60 degrees Fahrenheit, 1,000 cubic feet of air may contain 0.82 pounds of water and at zero degrees this could be reduced to 0.068 pound. So then from each 1,000 cubic feet of water saturated air it may be possible to cause the condensation of 0.752 pound of water, or about three-quarters of a pint.

DIESEL ENGINE FOR AUTOMOBILES

Some time ago it was announced that a light-weight Diesel engine had been invented for use in airships and I should like to know if this type is being used anywhere for automobile operation.—C. W. P.

Motorcycles equipped with single-cylinder Diesel engines are being operated all over Continental Europe, and today a German or other Continental Diesel engine that can be put under the hood of a motor vehicle is on the market, according to a paper by L. T. Pockman, which he presented at a recent meeting of the Southern California section of the Society of Automotive Engineers.

The full-Diesel type should be used for automotive purposes, he asserted, and a fuel injection pressure of about 1,500 pounds per square inch is desirable, with solid fuel injection. The Diesel engine must use present equipment for cooling and starting. Less rather than more cooling water will be required than for the gasoline engine, and the present electric starter will start a small Diesel the same as it starts the conventional engine. Moreover, the Diesel is easier to control than a gasoline engine of any type or size.

The light-weight Diesel engine that will meet these requirements is not a dream; every American and Continental Diesel-engine manufacturer is endeavoring to furnish it for automotive service, and Mr. Pockman prophesized that many of his hearers would be using such engines in their trucks next year. Even if the fuel vendor doubles or trebles the price of fuel oil when such engines become general, the truck users will still have the best of him, and although lubrication is more vital to the Diesel than to the gasoline engine, the operators can be sure that satisfactory service will be given.

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

	Mar. 26		Mar. 19		Mar. 12	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.06½	.06¾	.06½	.06¾	.06½	.06⅝
56-58 450 endpoint	.06½	.06¾	.06½	.06¾	.06½	.06⅝
58-60 450 endpoint	.06⅝	.06¾	.06½	.06¾	.06½	.06¾
*56-60 437 endpoint (U. S. Motor)	.0709		.0702		.0701	
*60-62 437 endpoint	.0743		.0741		.0725	
*60-62 400 endpoint	.0765		.0737		.0733	
64-66 375 endpoint	.0825		.07½†.07¾		.0800	
68-70 360 endpoint	.08	.08¼	.08⅛	.08¼	.08¼	.08¼
64-66 437 endpoint (blend)	.07¼	.07½	.06¾	.07	.06¾	.07
NORTH TEXAS—						
56-58 450 endpoint	.06½	.06⅝	.06½	.06⅝	.06¾	.06½
58-60 450 endpoint	.06½	.06⅝	.06½	.06⅝	.06¾	.06½
58-60 437 endpoint (U. S. Motor)	.06⅞	.07	.06⅝	.06¾	.06⅝	.06¾
60-62 400 endpoint	.07⅛	.07⅜	.07	.07¼	.07	.07¼
64-66 390 endpoint	.07⅜	.07½	.07¼	.07½	.07¼	.07½
64-66 375 endpoint	.07⅝	.07⅞	.07¼	.07¾	.07½	.08
68-70 360 endpoint	.07⅝	.07⅞	.07¼	.07¾	.07½	.08
68-70 360 endpoint	.08	.08¼	.08	.08¼	.08	.08¼
64-66 437 endpoint (blend)	.07		.06½	.06¾	.06½	.06¾
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.07¼		.07¼		.07¼	
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.07¼		.07¼		.07¼	
PENNSYLVANIA—						
52-54 Naphtha	.07¾	.08	.07¾	.08	.08	
54-56 Naphtha	.07¾	.08	.07¾	.08	.08	.08¼
58-60 Gasoline	.08½	.08¾	.08½	.08¾	.08½	.08¾
60 Gasoline	.09¼	.09½	.08¾	.09	.09	.09¾
62 Gasoline	.09¾	.10	.09¾	.10	.09¾	.10
64 Gasoline	.10¼	.10½	.10¼	.10½	.10¼	.10½
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.09	.10	.06	.07	.06	.07
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.06⅝	.06¾	.06⅝	.06¾	.06⅝	.06¾
56-58 450 endpoint	.06⅝	.06¾	.06⅝	.06¾	.06⅝	.06¾
58-60 437 endpoint (U. S. Motor)	.07	.07¼	.06¾	.07	.06¾	.07
60-62 400 endpoint	.07¼	.07½	.07¼	.07½	.07¼	.07½
64-66 375 endpoint	.07¾	.08	.07¾	.08	.07¾	.08
68-70 360 endpoint	.08¼	.08½	.08¼	.08½	.08¼	.08½
64-66 437 endpoint (blend)	.07⅛	.07¼	.07	.07⅛	.06⅞	.07⅛
GULF COAST (Export)—						
58-60 (U. S. Motor)	.08½		.08½		.08½	
60-62 400 endpoint	.09½		.09½		.09½	
61-63 390 endpoint	.09¾		.09¾		.09¾	
64-66 375 endpoint	.10		.10		.10	

*Weighted average prices March 25, 18 and 11 as reported by representative refiners. Sales to jobbers only. †No sales reported. Price shown general market.

NATURAL GASOLINE

	Mar. 26		Mar. 19		Mar. 12	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08		.07½		.06¾	.07
Grade AA, 80-87, 375 e.p., Rec. 90%	.08		.07½		.06¾	.07
Grade B, 76-83.9, 375 e.p., rec. 85%	.07		.06¾		.05¾	
Grade BB, 84-92, 375 e.p., rec. 85%	.07		.06½	.06¾	.05½	.05¾
Grade C, 80-90, 375 e.p., rec. 78%	.06¾		.06¼		.05	.05¼
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08		.07½		.07	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08		.07½		.06¾	.07
Grade B, 76-83.9, 375 e.p., rec. 85%	.06¾	.07	.06¾		.05¾	
Grade BB, 84-92, 375 e.p., rec. 85%	.06¾	.07	.06½	.06¾	.05½	.05¾
Grade C, 80-90, 375 e.p., rec. 78%	.06¾		.06¼		.05	.05¼
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.08½		.07¾		.07½	
Grade BB, 84-92, 375 e. p., rec. 85%	.07½		.06¾		.06¼	
Grade C, 80-92, 375 e.p., rec. 78%	.07¼		.06½		.05½	
CALIFORNIA—						
75-78, 375-390 endpoint	.09	.10	.06	.06½	.06	.06½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.08		.07½		.07	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08		.07½		.06¾	.07
Grade B, 76-83.9, 375 e.p., rec. 85%	.07		.06¾		.05⅝	
Grade BB, 84-92, 375 e.p., rec. 85%	.07		.06½		.05⅝	.05¾
Grade C, 80-90, 375 e.p., rec. 78%	.06¾		.06¼		.05	

BURNING OIL

	Mar. 26		Mar. 19		Mar. 12	
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.06½		.06	.06⅛	.05⅞	.06
42-44 water white Kerosene	.06⅞	.07	.06¼	.06½	.06⅛	.06⅜
NORTH LOUISIANA—						
41-43 water white Kerosene	.06¾	.07	.06¾		.06¾	
NORTH TEXAS—						
41-43 water white Kerosene	.06¾	.06½	.05¾	.06	.05¾	.06
40-42 water white Kerosene	.06¼	.06½	.05¾	.06	.05⅝	.05¾
ARKANSAS—						
41-43 water white Kerosene	.06¾	.07	.06¾		.06½	.06¾
PENNSYLVANIA—						
43 Kerosene prime white	.07		.07		.07	
45 Kerosene water white	.07⅛	.07¼	.07⅛	.07¼	.07	.07⅛
46 Kerosene water white	.07½	.07¾	.07½	.07¾	.07½	.07¾
47 Kerosene water white	.07¾	.08	.07¾	.08	.07¾	.08
300 Mineral Seal	.07¼	.07½	.07	.07¼	.07	.07¼
CALIFORNIA—						
38-40 water white Kero. (high-burning test)	.06½	.07	.06½	.07	.06	.06½
Engine distillate, 43-44, 445 endpoint	.07½	.08½	.06½	.07	.06½	.07
Engine distillate, 42-44, 480 endpoint	.07	.08	.06	.06½	.06	.06½
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.06⅜	.06½	.06	.06¼	.05¾	.06
42-44 water white Kerosene	.06¾	.07	.06¼	.06½	.06¼	.06½
GULF COAST (Export)—						
41-43 prime white	.07¾		.06¾		.06¾	
41-43 water white	.08¾		.07¾		.07¾	

FUEL OILS

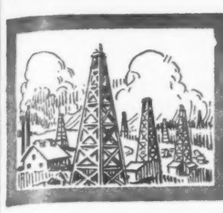
	Mar. 26		Mar. 19		Mar. 12	
OKLAHOMA (Group 3)—						
Below 18 Fuel Oil, per bbl.	.50	.55	.52½	.55	.52½	.55
18-22 Fuel Oil, per bbl.	.55	.62½	.57½	.62½	.57½	.62½
22-26 Fuel Oil, per bbl.	.62½	.67½	.62½	.67½	.62½	.67½
24-26 Fuel Oil, per bbl.	.67½	.72½	.67½	.72½	.67½	.72½
26-30 Fuel Oil, per bbl.	.85	.95	.85	.95	.85	.95
28-30 Fuel Oil, per bbl. (industrial)	.90	1.00	.90	1.00	.90	1.00
28-30 Fuel Oil, per bbl. (zero cold test)	1.05	1.10	1.05	1.10	1.05	1.10
32-36 Gas Oil (industrial)	.03	.03⅛	.03	.03⅛	.03	.03⅛
32-36 Gas Oil (straw color)	.03⅛	.03¼	.03⅛	.03¼	.03⅛	.03¼
36-38 Distillate	.03⅞	.04	.03⅞	.04	.04	.04⅛
38-40 Straw Distillate	.04	.04⅛	.04	.04⅛	.04⅛	.04⅜
NORTH TEXAS—						
Below 20 Fuel Oil	.65	.70	.65	.70	.65	.70
24-26 Fuel Oil, per bbl.	.70	.75	.70	.72½	.70	.72½
32-36 Gas Oil (straw)	.03⅛	.03¼	.03⅛	.03¼	.03⅛	.03¼
38-40 Straw Distillate	.04	.04⅛	.04	.04⅛	.04⅛	.04⅜
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.70	.75	.75	.80	.70	.80
32-36 Gas Oil	.03½		.03½		.03½	
ARKANSAS—						
33-36 Distillate	.03⅞	.04	.04⅛	.04¼	.04⅛	.04¼
32-36 Gas Oil (straw)	.03¼		.03½		.03½	
16-22 Refinery Fuel Oil, per bbl.	.70	.75	.70	.80	.70	.75
GULF COAST (South Texas)—						
Gas Oil	.03½	.04	.03½	.04	.03½	.04
Bunker C Fuel (cargo lots), per bbl.	.72½	.75	.72½	.75	.72½	.75
Bunker C Fuel (small lots)	.95	1.00	.95	1.00	.95	1.00
PENNSYLVANIA—						
30-34 Fuel Oil	.04½	.04¾	.04½	.04¾	.04½	.04¾
36-40 Fuel Oil	.05	.05⅛	.05	.05⅛	.04¾	.05
CALIFORNIA—						
33-36 Distillate	.03¾	.04	.03¾	.04	.03¾	.04
26-32 Distillate	.03	.03½	.03	.03½	.03	.03½
15-20 Fuel Oil, Bunker (at tide water)	.65	.85	.65	.85	.65	.85
15-20 Fuel Oil (cargo lots), per bbl.	.70	.85	.70	.85	.70	.85
27 plus Diesel, per bbl.	.90	1.05	.90	1.05	.90	1.05
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, bbl.	.65	.67½	.62½	.67½	.62½	.67½
18-22 Fuel Oil, per bbl.	.55	.60	.55	.60	.55	.60
28-30 Fuel Oil (zero)	1.10	1.20	1.10	1.20	1.10	1.20
32-36 Gas Oil, zero	.03	.03⅛	.03⅛		.03¼	.03½
32-36 Gas Oil (industrial)	.03	.03⅛	.03	.03⅛	.03⅛	.03¼
36-38 Distillate	.03⅞	.04	.03¾	.04	.04	.04¼
38-40 Straw Distillate	.04	.04⅛	.04	.04⅛	.04¼	.04½

LUBRICATING OIL AND WAX

	Mar. 26		Mar. 19		Mar. 12	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.06	.06½	.06	.06½	.06	.06½
100 vis., 3 color, 20-25 cold test	.05¼	.05½	.05¼	.05½	.05¼	.05½
150 vis., 3 color, 20-25 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
150 vis., 4 color, 20-25 cold test	.07	.07¼	.07	.07¼	.07	.07¼
180 vis., 3 color, 23-28 cold test	.08¾	.09	.08¾	.09	.08¾	.09
180 vis., 4 color, 23-28 cold test	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
180 vis., 5 color, 23-28 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
200 vis., 3 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09¼	.09½
200 vis., 4 color, 23-28 cold test	.09	.09¼	.09	.09¼	.09	.09¼
200 vis., 5 color, 23-28 cold test	.08½	.08¾	.08½	.08¾	.08½	.08¾
240 vis., 3 color, 25-30 cold test	.12¼	.12½	.12¼	.12½	.12¼	.12½
240 vis., 4 color, 25-30 cold test	.11¾	.12	.11¾	.12	.11¾	.12
240 vis., 5 color, 25-30 cold test	.10¾	.11	.10¾	.11	.10¾	.11
280 vis., 3 color, 25-30 cold test	.13¾	.14	.13¾	.14	.13¾	.14
280 vis., 4 color, 25-30 cold test	.12¾	.13	.12¾	.13	.12¾	.13
280 vis., 5 color, 25-30 cold test	.11¾	.12	.11¾	.12	.11¾	.12
Cylinder Stocks:						
600, steam refined, light green	.09	.10	.09	.10	.09	.10
600, steam refined, dark green	.07	.08	.07	.08	.07	.08
190-200 vis., D color Bright Stock	.33	.35	.33	.35	.33	.35
150-160 vis., D color Bright Stock	.30	.32	.30	.32	.30	.32
150-160 vis., E color Bright Stock	.28	.30	.28	.30	.28	.30
Waxes:						
124-126 White Crude Scale Wax	.03¾	.04	.03¾	.04	.03¾	.04
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.07¾	.08	.07¾	.08	.07¾	.08
36 Miners' Neutral	.07¼	.07½	.07¼	.07½	.07¼	.07½
150, 3 color	.21½	.22	.21½	.22	.21½	.22
180, 3 color	.25½	.26	.25½	.26	.25½	.26
200, 3 color	.27½	.28	.27½	.28	.27½	.28
220, 3 color	.30	.30½	.30	.30½	.30	.30½
600, steam refined	.23½	.24	.22½	.23	.22	.22½
635, steam refined	.29	.29½	.28½	.29	.27½	.28
650, steam refined	.30½	.31	.29	.29½	.27½	.28
600, Pennsylvania flash	.32½	.33	.31½	.32	.31½	.32
630, Pennsylvania flash	.37½	.38	.37	.37½	.36½	.37
600, E. filtered	.25½	.26	.25½	.26	.25½	.26
600, D filtered	.29½	.30	.29½	.30	.29½	.30
550, E. filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21½	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.42½		.39	.40	.39	.40
*122-124 White Crude Scale Wax	.04		.04		.04	
*124-126 White Crude Scale Wax	.04¼		.04¼		.04¼	

*At New York

GULF COAST (South Texas)—						
No. 2 color, 100 is., pale oil	.06½	.07	.06½	.07	.06½	.07
No. 3 color, 200 vis., pale oil	.09	.10	.09	.10	.09	.10
No. 3 color, 300 vis., pale oil	.10½	.11	.10½	.11	.10½	.11
No.No. 3½ color, 500 vis., pale oil	.11½	.12½	.11½	.12½	.11½	.12½
No. 4 color, 750 vis., pale oil	.14	.15	.14	.15	.14	.15
No. 5 to 6 color, 200 vis., red oil	.07½	.08½	.07½	.08½	.07½	.08½
No. 5 to 6 color, 300 vis., red oil	.08½	.09½	.08½	.09½	.08½	.09½
No. 5 to 6 color, 500 vis., red oil	.09½	.10½	.09½	.10½	.09½	.10½
No. 5 to 6 color, 750 vis., red oil	.13	.14	.13	.14	.13	.14



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

No. 2½ color, 200 vis., pale filtered	.11½		.11½		.11½	
No. 2½ color, 300 vis., pale filtered	.13	.13¼	.13	.13¼	.13	.13¼
No. 2½ color, 500 vis., pale filtered	.15½	.16	.15½	.16	.15½	.16
No. 2½-3 color, 750 vis., pale filtered	.18	.20	.18	.20	.18	.20
CALIFORNIA—						
130 vis., 2½-3 color	.10¼	.10½	.10¼	10½	.10¼	.10½
200 vis., 2½-3 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
300 vis., 3-3½ color	.13	.13¼	.13	.13¼	.13	.13¼
350 vis., 3½-4 color	.13½	.13¾	.13½	13¾	.13½	.13¾
400 vis., 3½-4 color	.15	.15½	.15	.15½	.15	.15½
Red Neutral:						
200 vis., 4½-5 color	.11	.11¼	.11	.11¼	.11	.11¼
300 vis., 5-6 color	.12	.12¼	.12	.12¼	.12	.12¼
400 vis., 5-6 color	.13¼	.14	.13¼	.14	.13¼	.14
500 vis., 4½-5 color	.15¼	.15½	.15¼	.15½	.15¼	.15½
500 vis., 5-6½ color	.15	.15¼	.15	.15¼	.15	.15¼
600 vis., 6½ plus color	.16	.16¼	.16	.16¼	.16	.16¼

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Mar. 26		Mar. 19		Mar. 12	
‡Gasoline, U. S. Motor, 58-60, 437	.08¾		.09		.09¼	
Kerosene, water white, 41-43	.08		.08¼	.08½	.08½	
*Fuel Oil, Bunker "C," 14-16, per bbl.	1.05		1.05		1.05	
‡Fuel Oil, Diesel, 28-30, per bbl.	2.00		2.00		2.00	
Gas Oil, 32-36 gravity	.05	.05½	.05¼		.05¼	
25 pale Paraffin Oil	.10½		.11¾		.11¾	
28 pale Paraffin Oil	.07¼		.07½		.07½	
285 red Paraffin Oil	.11½		.11½		.11½	
250 red Paraffin Oil	.11		.11		.11	
225 red Paraffin Oil	.09½		.09½		.09½	
200 red Paraffin Oil	.09		.09		.09	
Refined Wax:						
120-122 a.m.p., per lb.	.047⅞		.047⅞		.05¼	
125-127 a.m.p., per lb.	.05⅛		.05⅛		.05½	
130-132 a.m.p., per lb.	.06¼		.06¼		.06¼	
133-135 a.m.p., per lb.	.06¾		.06¾		.07	
135-137 a.m.p., per lb.	.07½		.07½		.07½	
Petrolatum in barrels, carload lots, per lb.						
Dark green	.02		.02		.02	
Amber	.03½		.03½		.03½	
Extra amber	.03¾		.03¾		.03¾	
Cream	.06½		.06½		.06½	
Lily white	.07½		.07½		.07½	
Snow white	.08½		.08½		.08½	

*Lighterage 5.0 cents a barrel extra. †Lighterage 6.5 cents a barrel extra. ‡Price of 9¼ cents became effective March 5.

*NEW YORK (BAYONNE) EXPORT PRICES

	Mar. 26	Mar. 19	Mar 12	
Kerosene, prime white	.08			
Kerosene, water white	.09			
300, steam refined cylinder stocks, in bbls.	.31½	.31	.30	.31
335, steam refined	.34½	.34	.32	.33
350, steam refined	.38½	.38	.36	.37
600, Pennsylvania flash	.41	.39	.38	.39
630, Pennsylvania flash	.46	.44	.43	.44
600, Warren E.	.35½	.34½	.34	.35
600, Oil City E.	.34½	.33½	.33	
Light 140-150 Bright Stocks	.50	.48	.46½	
Dark 140-150 Bright Stocks	.48½	.47	45	

*Export prices on U. S. Motor Gasoline, in cases, and prime white and water white kerosene in cases withdrawn.

LOS ANGELES EXPORT PRICES

	Mar. 26		Mar. 19		Mar 12	
Kerosene, water white	.05½	.06	.05½	.06	.05½	.06
U. S. Motor Gasoline, 53-55, 437 e.p.	.07	.07½	.07	.07½	.07	.07½

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (January 11)*	.80
Other fields	See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties—See gravity table.

WEST TEXAS

Iatan*	Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler and Glasscock (July 26)‡	$ .65
Chalk†	.65
Mitchell†	.65

*Includes Howard County and Westbrook fields.
†Magnolia Petroleum Co., January 26, 1929.
‡Posted by Humble Oil & Refining Co.
Magnolia Petroleum Co., and Gulf Pipe Line Co.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Below 36 gravity April 1)	$ .75
Bellevue	1.20
Urania (Oct. 16, 1928)	.90
East El Dorado (March 16, 1927)	1.00
Other fields	See gravity table

Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in **Mid-Continent gravity price table.**

Note—Cotton Valley and Bellevue posted by Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co., and Magnolia Petroleum Co.; Urania posted by Louisiana Oil Refining Corp.; East El Dorado, Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST

(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, Sugarland, Raccoon Bend, High Island, Pierce Junction and Spindletop.)

Grade A (March 14)*	$1.20
Grade B	See gravity table
Jennings, La. (March 14)†	$1.05
Saratoga, Batson, Daytona (March 14, 1927)‡	1.20
Markham (March 14)§	1.00
High Island (December 14)¶	1.00

*Humble Oil & Refining Co. and other major buyers. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. §The Texas Company.
¶Posted by Gulf Pipe Line Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.
(Effective January 25, 1929)

Rock Creek, Wyo.	$1.18
Salt Creek	See gravity table
Big Muddy	1.28
Grass Creek, heavy (July 27, 1928)	.90
Grass Creek, light	1.36
Mule Creek (May 1, 1928)	1.10
Elk Basin	1.36
Lance Creek	1.38
Poison Spider (March 14, 1927)	1.00
Notches (March 14, 1927)	.65
Rex Lake (February 22)	1.10
Osage	1.38
Lost Soldier (contract)	1.00
Hamilton Dome (March 14, 1927)	.85
Greybull	1.57
Cat Creek (Montana) (July 27, 1928)	1.48
Sunburst (Montana) (May 18, 1928)	1.65
Torchlight	1.38
Artesia (July 27, 1928)	1.08
Hogback (New Mexico) (July 27, 1928)	1.43

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

Luling (January 11)*	$ .80
Mirando (January 7)†	.80
Rockdale-Minerva (April 15):	
Below 28 gravity	1.25
28-38.9 gravity	1.27
39-39.9 gravity	1.29
40 and above	1.31
Thrall‡	
Callihan (May 15)	1.75
Lytton Springs (Lockhart)	See gravity table
Somerset	See gravity table

*Posted by Magnolia Petroleum Co.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.
‡Thrall prices same as North Central Texas less 19½ cents per cwt. freight.

EASTERN STATES

(Effective January 4, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$4.10
Bradford District Oil in National Transit Lines (Pennsylvania)	4.10
Penna Grade Oil in National Transit Lines (Pennsylvania)	4.00
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	4.00
Penna Grade Oil in Eureka Pipe Line Lines (Pennsylvania)	3.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.85
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (March 12)	1.45
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (January 25, 1929)	1.65
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (January 25, 1929)	1.75
Somerset Oil in Cumberland Pipe Line Lines (Kentucky) (March 12, 1929)	1.50
Ragland Grade Oil in Cumberland Pipe Line Lines (Kentucky) (Jan. 29)	.60

MEXICAN CRUDE

Panuco heavy (f.o.b. Mexican ports) ..$1.15

Note—Due to the fact that the exportation of Tuxpan light crude has become a negligible factor, prices will no longer be published.

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective January 25, 1929)

Lima	$1.50
Wooster	1.62
Illinois	1.45
Indiana	1.27
Princeton	1.45
Plymouth	1.18
Waterloo (November 17, 1926)	1.35
Western Kentucky (Sept. 17, 1928)	1.53
Dundee, Mich. (Mar. 11, 1929)**	.60
Midland, Mich. (January 15, 1929)*	1.79
Saginaw, Mich., Saginaw Sand (February 10)†	1.89
Saginaw, Mich., Berea Sand (February 10)†	1.79

(Continued on Page 146)

CRUDE OIL GRAVITY TABLE

Gravity—	Okla., N. C. Tex. 1	No. La. and Arkansas 2	Smackover, Ark. 3	Stephens, Ark. 4	Wheeler (Texas Panhandle) 5	Gray County (Texas Panhandle) 6	Carson and Hutchinson (Texas Panhandle) 7	Salt Creek, Wyo. 8	Grade B & Light Crude (G. Coast) 9	Somerset (South Central Texas) 10
24 and above	....	....	.90	....	....	....	....	....	....	....
Below 24	....	....	.75	....	....	....	....	....	....	....
Below 25	.60	....	....	....	....	....	....	....	1.05	....
25 to 25.9	.66	....	....	....	....	....	....	....	1.07	....
Below 26	....	....	....	....	....	....	....	....	....	....
26 to 26.9	.72	....	....	....	....	....	....	....	1.09	....
27 to 27.9	.78	....	....	....	....	....	....	....	1.11	....
Below 28	....	.78	....	.70	.70	.69	.72	....	....	....
28 to 28.9	.84	.84	....	.74	.70	.69	.72	....	1.13	....
29 to 29.9	.90	.90	....	.78	.70	.75	.72	.99	1.15	....
30 to 30.9	.96	.96	....	.82	.76	.81	.72	.96	1.17	....
31 to 31.9	1.02	1.02	....	.86	.82	.87	.72	1.02	1.19	....
32 to 32.9	1.08	1.08	....	.90	.88	.93	.78	1.08	1.21	1.05
33 to 33.9	1.11	1.13	....	....	.91	.96	.81	1.11	1.23	1.07
34 to 34.9	1.14	1.14	....	....	.94	.99	.84	1.14	1.25	1.09
35 to 35.9	1.17	1.17	....	....	.97	1.02	.87	1.17	1.27	1.11
36 to 36.9	1.20	1.20	....	....	1.00	1.05	.90	1.20	....	1.13
37 to 37.9	1.23	1.23	....	....	1.03	1.08	.93	1.23	....	1.15
38 to 38.9	1.26	1.26	....	....	1.06	1.11	.96	....	....	1.17
39 to 39.9	1.29	1.29	....	....	1.09	1.14	.99	....	....	....
40 to 40.9	1.32	1.32	....	....	1.12	1.17	1.02	....	....	....
41 to 41.9	1.35	1.35	....	....	1.15	1.20	1.05	....	....	....
42 to 42.9	1.38	1.38	....	....	1.18	1.23	1.08	....	....	....
43 to 43.9	1.41	1.41	....	....	1.21	1.26	1.11	....	....	....
44 and above	1.44	1.44	....	....	1.24	1.29	1.14	....	....	....

Column 1, Note—Magnolia Petroleum Co. posted schedule January 24, 1929, making price below 26 gravity 60 cents per barrel, 26-26.9 gravity 65 cents, 27-27.9 gravity 70 cents, 28-28.9 gravity 75 cents, 29-29.9 gravity 80 cents, 30-30.9 gravity 90 cents and 31-31.9 gravity $1, with balance of the price schedule as shown.

Oklahoma—Humble Oil & Refining and Carter Oil Co. January 24, Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., The Texas Company, January 25.

North Central Texas—Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas, Iatan and Panola, Iatan posted a flat price of 92 cents by Magnolia on January 14, 1928), Currie, Nocona and Moran. Prairie, Sinclair and Gulf, The Texas Company, January 25, Humble Oil & Refining Co., January 24.

Kansas—Prairie, Sinclair and The Texas Company, January 25; Carter, January 24.

Column 2—Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, DeSoto, Haynesville, Homer and El Dorado only], Standard Oil Co. of Louisiana, Louisiana Oil Refining Corp., Gulf Refining Co., Magnolia Petroleum Co., schedule effective January 26 applies to Pine Island, Haynesville, Bull Bayou, Louisiana, and El Dorado, Ark., light crude. The Texas Company January 24 posted prices below 28 gravity at 6 cents differential per degree with minimum of 60 cents for all below 24 gravity.

Column 3—February 6, Louisiana Oil Refining Corp.: February 7, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co., and on February 10, Atlantic Oil Producing Co.

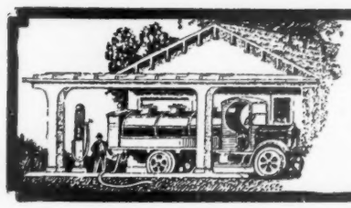
Column 4—Atlantic Oil Producing Co., Louisiana Oil Refining Corp., January 28.

Column 5, 6 and 7—Humble Oil & Refining Co., Magnolia Petroleum Co., January 24, 1929.

Column 8—Midwest Refining Co., January 25, 1929. All crude over 37 gravity $1.23 per barrel.

Column 9—Humble Oil & Refining Co. and other major buyers January 26 (schedule ends 35 and above), with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. and The Texas Company posted 2 cents differential for each degree above 35 gravity and 1.37 for 40 gravity and above.

Column 10—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns March 26.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Chicago dist.†	14.0	15.0	...	13.0
Decatur, Ill.	14.2	15.2	...	13.1
E. St. Louis	13.4	14.4	...	12.2
Joliet	14.4	15.4	...	13.3
Peoria	14.2	14.0	...	13.1
Quincy	14.2	15.2	...	12.9
Davenport, Ia.	17.5	18.5	3.0	13.3
Des Moines	17.5	18.5	3.0	13.3
Keokuk	17.5	18.5	3.0	14.3
Sioux City	17.1	18.1	3.0	12.9
Duluth, Minn.	17.5	18.5	2.0	13.9
Mankato	17.1	18.1	2.0	13.7
Minneapolis	17.2	18.2	2.0	13.9
La Crosse, Wis.	17.2	18.2	2.0	14.0
Milwaukee	16.1	17.1	2.0	12.9
Madison	16.3	17.3	2.0	13.1
Detroit, Mich.	17.8	18.8	3.0	14.7
Grand Rapids	17.7	18.7	3.0	14.6
Saginaw	17.9	18.9	3.0	14.8
Evansville, Ind.	17.0	18.0	3.0	14.0
Fort Wayne	17.4	18.4	3.0	14.4
Indianapolis	17.2	18.2	3.0	14.2
South Bend	17.4	18.4	3.0	14.4
Fargo, N. D.	18.9	19.9	2.0	15.9
Huron, S. D.	19.3	20.3	4.0	14.7
Sioux Falls	18.1	19.1	4.0	14.4
K. C., Mo.*	16.9	17.9	3.0	11.6
Springfield*	16.8	17.8	3.0	12.5
St. Louis*	15.9	16.9	2.5	12.3
St. Joseph	16.5	17.5	3.0	12.2
Wichita, Kans.	14.8	15.8	2.0	11.8
Bartlesville, Ok.	15.5	16.5	3.0	11.5

*State tax 2 cents; remainder city tax.
†Effective February 20, discounts on Q.D.A. in Chicago district 2 cents off service station price on purchases of 500 gallons or more per month and 4 cents on purchases of 1,000 gallons or more per month.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14.7	11.9
V. M. & P. naphtha	16.2	12.9
Cleaner's naphtha	18.0	13.9
Stanisol	19.0	14.4

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting. Effective January 5.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 799 gallons	8.0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

The following quantity discounts from the service station price are allowed on monthly sales of gasoline: 2,000 gallons or less, 2 cents; more than 2,000 and less than 6,000 gallons, 2½ cents; more than 6,000 gallons, 3 cents. Discounts are allowed each month, and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	15.0	*20.0	...	14.0
Philadelphia	15.0	*20.0	...	14.0
Scranton	15.0	*20.0	...	14.0
Allentown	15.0	*20.0	...	14.0
Altoona	15.0	*20.0	...	14.0
Erie	15.0	19.0	...	14.(
Dover, Del.	18.0	20.0	3.0	14.0
Wilmington	18.0	20.0	3.0	14.0
Springf'd, Mass.	18.0	20.0	2.0	15.0
Worcester	18.0	20.0	2.0	15.0
Boston	18.0	20.0	2.0	15.0
Providence, R.I.	18.0	20.0	2.0	15.0
Hartford, Conn.	18.0	20.0	2.0	14.0
New Haven	18.0	20.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the state.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Omaha	16.25	18.25	2.0	12.25
McCook	17.75	19.75	2.0	13.75
Norfolk	16.75	18.75	2.0	12.75
N. Platte	17.75	19.75	2.0	13.50
Scottsbluff	17.75	19.75	2.0	13.25

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
N. Orleans, La*	15.5	19.5	5.0	16.0
Baton Rouge	14.0	18.0	4.0	14.5
Alexandria	15.0	19.0	4.0	16.0
Lafayette†	16.0	20.0	5.0	14.0
Lake Charles	13.5	17.5	4.0	16.0
Shreveport	15.0	19.0	4.0	15.0
Knoxv'le, Tenn.	20.0	24.0	5.0	16.0
Memphis	18.0	22.0	5.0	12.5
Chattanooga	19.5	23.5	5.0	16.0
Nashville	19.0	23.0	5.0	16.0
Bristol	20.0	23 0	5 0	14 0
Lit. Rock, Ark.	17.0	21.0	5.0	13.0

*Tax of 5 cents includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax. †Five-cent tax includes 1-cent tax in Lafayette Parish.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.	21.0	23.0	4.0	16.5
Augusta	21.0	23.0	4.0	15.5
Macon	21.0	22.0	4.0	16.5
Savannah	20.0	22.0	4.0	15.5
Birm'ham, Ala.	18.0	20.0	4.0	13.0
Mobile	21.0	23.0	4.0	15.0
Montgomery	22.0	24.0	4.0	16.5
Clarks'le, Miss.	21.0	23.0	5.0	12.5
Jackson	20.0	22.0	5.0	13.0
Natchez	20.5	22.5	5.0	14.0
Gulfport	22.5	24.5	5.0	14.0
Vicksburg	20.5	22.5	5.0	14.0
Jack'ville, Fla.	22.0	24.0	5.0	14.5
Miami	23.0	25.0	5.0	15.5
Pensacola	23.0	25.0	5.0	14.5
Tampa	22.0	24.0	5.0	14.5
Lexington, Ky.	20.0	22.0	5.0	15.5
Covington	20.0	21.0	5.0	15.5
Louisville	20.0	22.0	5.0	15.0
Ashland	21.0	23.0	5.0	15.5
Catlettsburg	21.0	23.0	5.0	15.5

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. Pensacola and Mobile taxes include 1-cent city levy. Gulf port tax includes privilege tax of 2 cents in addition to state tax.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	16.0	18.0	...	15.0
New York*	16.0	18.0	...	15.0
Buffalo	16.0	18.0	...	14.0
Rochester	16.0	18.0	...	14.0
Syracuse	16.0	18.0	...	15.0
Boston, Mass.	18.0	20.0	2.0	15.0
Augusta, Me.	20.0	22.0	4.0	15.0
Manch't'r, N.H.	20.0	22.0	4.0	15.0
Burlington, Vt.	19.0	20.0	4.0	15.0

*Prices in steel barrels.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlantic City	16.0	20.0	2.0	13.0
Newark, N. J.	16.0	20.0	2.0	13.0
Annapolis, Md.	18.0	22.0	4.0	13.0
Baltimore	18.0	22.0	4.0	12.0
Cumberland	18.0	22.0	4.0	13.0
Washington	16.0	20.0	2.0	12.0
Danville, Va.	19.0	23.0	5.0	13.0
Norfolk	19.0	23.0	5.0	13.0
Petersburg	19.0	23.0	5.0	13.0
Roanoke	19.0	23.0	5.0	13.0
Richmond	19.0	23.0	5.0	13.0
Charles'n, W.Va.	18.0	22.0	4.0	13.0
Keyser	18.0	22.0	4.0	13.0
Parkersburg	18.0	22.0	4.0	13.0
Wheeling	18.0	22.0	4.0	13.0
Charlotte, N. C.	18.0	22.0	4.0	13.0
Hickory	18.0	22.0	4.0	13.0
Mt. Airy	18.0	22.0	4.0	13.0
Salisbury	18.0	20.0	4.0	13.0
Charls'ton, S. C.	19.0	23.0	5.0	13.0
Columbia	19.0	23.0	5.0	13.0

OHIO

Standard Oil Co. (Ohio)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
All Ohio points	17.0	18.0	3.0	12.0

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	16.0	20.0	2.0	12.0
Fort Worth	13.0	16.0	2.0	12.0
Houston	16.0	20.0	2.0	13.0
San Antonio	13.0	17.0	2.0	11.0
El Paso	17.0	20.0	2.0	16.0
Texarkana	16 0	20.0	2.0	13.0
Muskogee, Ok.*	15 0	17.0	3.0	12.0
Okla. City*	16.0	18.0	3.0	12.0
Tulsa*	17.0	19.0	3.0	10.0
Ft. Smith, Ark.	15.0	19.0	5.0	12.0
Little Rock	17.0	21.0	5.0	13.0

*Gasoline tank wagon price to dealers 2 cents under posted tank wagon.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Denver, Colo.	14 0	16 0	3.0	14.5
Pueblo	17.0	20.0	3.0	14.5
Grand Junction	21.5	24.5	3.0	18.0
Casper, Wyo.	18.0	21.0	3.0	13.0
Cheyenne	19.0	22.0	3.0	14.5
Butte, Mont.	22.5	25.5	3.0	19.0
Helena	22.5	25.5	3.0	19.0
Salt Lake, Utah	21.0	24.0	3.5	17.0
Albu'que, N. M.	22.0	25.0	5.0	17.0
Boise, Idaho	23.5	26.5	4.0	19.0
Twin Falls	23.5	26.5	4.0	19.0

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
San Francisco	19.0	23.0	3.0	15.5
Los Angeles	18.5	22.5	3.0	15.5
Reno, Nev.	24.0	26 0	4.0	19.0
Portland, Ore.	19.5	23.5	3.0	16.5
Seattle, Wash.	18.5	22.5	2.0	16.5
Tacoma	18.5	22.5	2.0	16.5
Spokane	22.5	26.5	2.0	20.5
Phoenix, Ariz.	18.0	22.0	4.0	20.5

TANK WAGON CHANGES

February 23—Standard Oil Co. of Kentucky reduced kerosene tank wagon price one-half cent at Clarksdale, Miss.

March 14—Magnolia Petroleum Co. reduced kerosene 1 cent at Fort Smith, Ark., to 12 cents.

March 19—Standard Oil Co. of California advanced gasoline tank wagon and service station prices 2 to 6 cents a gallon throughout entire territory with exception of Arizona.

March 20—Continental Oil Co. advanced gasoline tank wagon and service station prices 2 cents at Boise, Idaho.

March 20—Standard Oil Co. of Louisiana reduced the gasoline tank wagon and station prices 2 cents at Lake Charles, La., to 13.5 cents and 17.5 cents.

March 21—Standard Oil Co. of Indiana advanced kerosene tank wagon 1 cent throughout the entire territory.

FIELD RADIO STATIONS

WASHINGTON, D. C., Mar. 25.—Twelve licenses for radio stations to be used in exploration for oil and in communication between geophysical exploration parties have been granted by the Federal Radio Commission to the Interstate Geophysical Explorations Co. of Texas, Louisiana and New Mexico. Communication must be confined to messages concerned with geophysical surveys. Decision in respect to licenses for point to point communication is not expected for two or three months.

CRUDE OIL PRICES

(Continued from Page 145)

Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky (March 16)‡	1.6
Oil in line in Stoll Oil Refining Co. in Oil City, Ky. (Feb. 16, 1929)§	1.6
Oil Springs (Canada)¶	1.5
Petrolia (Canada)¶	1.6

*Posted by Pure Oil Co.
†Posted by Sun Oil Co.
‡Posted by Paragon Development Co.
§Posted by Stoll Oil Refining Co.
¶Posted by Imperian Oil Co., Ltd.
**Posted by Standard of Indiana.

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co.-Union Oil Co. (Effective January 18, 1929)

Gravity	Salt Lake, Potrero, Newport, Long Beach Summerland, Lawndale, Los Angeles, Fullerton, Richfield, Torrance, Olinda-Brea, Alamitos Heights, Signal Hill, Seal Beach, Huntington Beach, Athens, Inglewood, Rosecrans-Domingues, Watsonville — 1	Whittier, La Habra, Coyote Hills — 2	Midway-Sunset Elk Hills, Lost Hills, Belridge, Buena Vista Hills — 3	Montebello — 4	Santa Fe Springs — 5	Santa Marie, Coalinga — 6	Wheeler Ridge, Fruitvale — 7	Orcutt — 8	Ventura, Rincon, Ventura Ave. — 9	Elwood, Torrance — 10
14 to 14.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
15 to 15.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
16 to 16.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
17 to 17.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
18 to 18.9	.75	.75	.56	.70	....	.56	.56	.70	.75	....
19 to 19.9	.80	.80	.62	.75	....	.62	.62	.70	.80	....
20 to 20.9	.85	.84	.68	.80	....	.68	.68	.70	.85	....
21 to 21.9	.89	.88	.74	.85	.89	.74	.74	.86	.86	....
22 to 22.9	.92	.91	.80	.90	.92	.80	.80	.87	.87	....
23 to 23.9	.97	.94	.85	.95	.95	.85	.85	.90	.90	....
24 to 24.9	1.01	.97	.90	.98	.98	.88	.88	.94	.94	....
25 to 25.9	1.05	1.00	.95	1.01	1.01	.91	.91	.98	.98	....
26 to 26.9	1.09	1.04	1.00	1.04	1.04	.94	.94	1.02	1.02	....
27 to 27.9	1.13	1.08	1.05	1.07	1.07	.98	.97	....	1.06	....
28 to 28.9	1.17	1.12	1.10	1.10	1.10	1.02	....	....	1.10	....
29 to 29.9	1.21	1.16	1.16	1.13	1.15	1.06	....	....	1.14	....
30 to 30.9	1.25	1.20	1.22	1.16	1.20	1.10	....	....	1.18	....
31 to 31.9	1.30	....	1.28	....	1.25	1.14	....	....	1.23	....
32 to 32.9	1.35	....	1.34	....	1.30	1.18	....	....	1.28	....
33 to 33.9	1.41	....	1.40	....	1.35	1.22	....	....	1.34	....
34 to 34.9	1.47	....	1.46	....	1.40	1.26	....	....	1.40	1.3
35 to 35.9	1.53	....	....	....	1.45	1.30	....	....	1.46	1.3
36 to 36.9	1.59	....	....	....	1.50	....	....	....	1.52	1.4
37 to 37.9	1.65	....	....	....	1.55	....	....	....	1.58	1.4
38 to 38.9	1.71	....	....	....	1.60	....	....	....	1.64	1.4
39 to 39.9	1.77	....	....	....	1.65	....	....	....	1.70	1.4
40 to 40.9	1.83	....	....	....	....	....	....	....	1.76	1.5
41 to 41.9	1.89	....	....	....	....	....	....	....	1.82	1.5
42 to 42.9	1.95	....	....	....	....	....	....	....	1.88	1.6

Kern River, Newhall-McKittrick, Mount Poso and Round Mountain 11 to 13.9 gravity 45 cents, 14 gravity and above 50 cents, effective October 2, 1929. On December 1, 1929 the Union Oil Co. posted Midway-Sunset, Elk Hills, Buena Vista, Lost Hills and Coalinga crude as follows: 11 to 13.9 gravity at 45 cents, 14 gravity and above 50 cents.

Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights Crude, 11 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity. Domingues and Athens-Rosecrans, 24 to 42.9 gravity.

Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.

Column 3—Kern River, Newhall and McKittrick, 11 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 11 to 33.9 gravity; Lost Hills, 11 to 34.9 gravity; oil below 11 gravity posted at 45 cents.

Column 6—Oil below 14 gravity posted at 45 cents.

Columns 8 and 9 posted by Union Oil Co. only.

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Oil Securities Display Good Strength

Fail to Follow Downward Trend of General Market After Call Money Advance Except in a Few Cases

The spectacular advances in the call money rate played havoc with the general market on Monday and Tuesday of this week, and temporarily checked any hope for the materialization of the long expected "oil market." It must be considered, however, that the oils as a group displayed good strength and failed to follow the downward trend of the general market except in a few cases.

Call money advanced to 14 per cent on Monday, and touched 20 per cent on Tuesday of this week, and a general throwing overboard of stocks followed. Once more the oil stocks have acted counter to the general market, due primarily to the feeling that the industry is showing some signs of improvement.

Skelly Oil

Report of Skelly Oil Co. and subsidiaries for year ended December 31, 1928, shows net profit of $4,104,376 after interest, taxes, depreciation and depletion, etc., equivalent to $3.76 a share (par $25) earned on 1,089,570 shares of stock. This compares with $1,438,228 or $1.31 a share on 1,093,669 shares in 1927.

Standard of Kentucky

Report of Standard Oil Co. of Kentucky for year ended December 31, 1928, shows net profit of $4,745,604 after federal taxes, equivalent to $6.94 a share on the 684,120 old shares of $25 par outstanding practically the entire year. This compares with $4,492,008 or $6.56 a share in 1927. The above 1928 earnings do not include tax adjustment for prior years amounting to $1,980,186 which was credited to surplus account. Capital stock now outstanding amounts to 2,565,460 shares of $10 par value.

W. E. Smith, president of the company, said: "The year of 1928 was a fairly profitable one for our company, although the petroleum industry was during that time, and in fact still is, in a more or less chaotic condition. Overproduction of crude oil and low wholesale and retail prices for refined products made a condition more complicated than ever before.

"It is expected that far reaching and important results will come from the efforts being made by the American Petroleum Institute to formulate a code of fair practices for the marketing of petroleum products. If the code is successful, as it is hoped it will be, it should be of great help to us in the future.

"Our sales in the South were affected by storms, high water and continued rains. As a result, it was necessary to spend a considerable sum of money in repairs. Our properties are now reaching a point of excellent physical condition, which will enable us to serve the public at the least possible cost.

"Throughout the southern states in which we operate we have made progress. During the past year our facilities for doing business have greatly improved and our possessions have increased. Our organization has been developed to a higher degree of efficiency and I believe every employe is doing his best to make this company successful. This is especially true since about 75 per cent of our employes are particicpants in the stock purchase plan.

"Just what 1929 will bring us is all a guess, but I predict with an even break the Kentucky company will make a creditable showing."

James B. Brown was elected an additional director of Standard Oil Co. of Kentucky at annual meeting. Retiring directors and officers were re-elected.

Superior Oil

Superior Oil Corp. has listed 960,000 additional no par shares of capital stock, bringing total outstanding stock to 2,330,938 shares out of 2,500,000 authorized. Directors on March 2, 1929, authorized issuance of 560,000 shares of the additional stock for acquisition or 333,200 common shares out of 400,000 authorized shares of Moody Corp.

Standard of Ohio

Report of the Standard Oil Co. of Ohio for year ended December 31, 1928, shows net profit of $3,896,548 after depreciation, Federal taxes, etc., equivalent after 7 per cent preferred dividend requirements to $6.08 a share (par $25) This compares with net profit of $2,335,042 or $3.29 a share on common in 1927. In latter year no provision was made for Federal taxes due to the fact that loss caused by obsolescene of company's Burton stills more than offset the earnings for the year and was taken as a deduction on company's Federal tax return. This loss was charged against the profit and loss surplus account.

The Texas Corporation

In his annual report, President R. C. Holmes of The Texas Corporation says activities expanded vastly in 1928 by acquisition of several large properties, notably California Petroleum Corp., some assets of Galena Signal Oil Co. and Landreth Production Co. The total new investment was $62,389,880 in producing, refining, sales and other departments.

A favorable development responsible, to considerable degree, for profits more than doubling to $45,073,880 was the better market for gasoline plus the fact The Texas Corporation largely expanded its gallonage and reduced overhead. Even though crude oil prices were lower, company did not have to charge earnings for inventory adjustments because all products, carried at cost, were lower than the market.

Discussing general oil situation, Mr. Holmes states there are several conditions vital to the industry's welfare which require correction, namely, continued overproduction, costly and wasteful production methods in some areas, multiplication of marketing facilities and overproduction of fuel oil which is forced on the market, to compete with coal, at much less than its value.

He sees an increasing spirit of co-operation between Federal and State authorities and the industry "which gives promise of substantially improving conditions." Referring to the initiation of co-operative movement by Former President Coolidge in 1924 and the work of the Federal Oil Conservation Board, he concludes:

"Recently large and representative committees of the industry have been appointed by the American Petroleum Institute to study thoroughly the work that has heretofore been done, the situation in this country, the whole world situation and, in co-operation with Federal and State authorities, to formulate a definite program which it is hoped will result in a substantial conservation of our crude oil supply and give greater stability to the industry and protection to the consuming public."

Atlantic Refining

Atlantic Refining Co. has offered stockholders of record April 1 the right to subscribe at $40 a share for 666,667 shares of new common stock, in the ratio of one new share for each three shares now held. Fractional rights will be issued, but no fractional shares. The directors voted to retire the outstanding $20,000,000 of 7 per cent nonvoting preferred stock at $115 a share on May 1. The proceeds from the sale of the new common will be used to retire this preferred, and other corporate purposes.

Vacuum Oil

The board of directors of the Vacuum Oil Co. has fixed $103.27 a share as the price at which trustees may purchase stock for the second general employe stock purchasing plan for the period February 1 to April 30, representing the average of the daily high and low sales for the three months preceding February 1.

Houston Oil

In his annual report to stockholders of the Houston Oil Co. and the Houston Pipe Line Co., E. H. Buckner, president, said:

"We have increased our holdings in Oklahoma, West Texas, New Mexico and South Texas. Additions are being made to our refinery at Camden, Ark. During the year we drilled several wells in Oklahoma and extreme South Texas, but on account of the low price of oil we have derived little profit from them so far. We also have drilled several gas wells, which, with the coming in of new fields in South Texas, add considerably to our already large gas reserves.

"About 90 per cent of the gas of the oil company is sold to large industrial consumers through its wholly-owned subsidiary, the Houston Pipe Line Co. The Houston Pipe Line Co. is selling an increasing amount of gas to other gas utilities not owned by it for resale and direct distribution to numerous domestic consumers. This business, while not very large, is showing a satisfactory increase.

"The Houston Pipe Line Co. has completed a compressor station at Bruni, Tex., the southern terminus of the ga

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Par value	Stocks	Week ended March 22 Sales	Open	High	Low	Last	Change
$6.75	.45	2⅞	.55	1½	.53	$5	Amer. Con. Oilfields	8,600	56	59	55	59	+ 3
..	..	7½	2¾	9½	3⅛	N.P.	Amer. Maracaibo	7,400	5½	5½	5¼	5¼	— ¼
..	..	2¾	1	4½	2¼	$10	Argo Oil	1,400	2⅝	2¾	2½	2½	.....
85¼	60	40	20½	55	32¾	N.P.	British American	No sales.					
28⅜	9¼	28¼	15½	4½	3⅞	25c	Carib. Syndicate (new)	3,200	3¼	3½	3⅛	3⅜	— ⅛
..	..	58¾	40¼	90⅞	54	$20	Cities Service	41,000	120½	121⅞	120½	121	+ ½
..	..	95⅜	87	103½	94½	100	Cities Service, pfd.	3,100	97¼	97⅜	97	97⅜	— ⅛
..	..	8⅞	7⅜	9⅝	8⅞	10	Cities Service, pfd. B	500	9	9	9	9	.....
3½	1¾	3⅞	1⅛	3¼	76	1	Colombia Syndicate	7,800	1⅜	1¼	1⅛	1¼	.....
..	..	9¾	6⅜	8⅞	6¼	10	Consolidated Royal	9,700	8⅞	10⅝	8⅞	10¼	+ 1⅝
16	10	14⅞	9½	17½	9½	N.P.	Creole Syndicate	21,400	9	9⅞	9¼	9¾	+ ½
..	..	3	.50	3¼	.76	N.P.	Crown Central	1,400	1½	1⅝	1½	1½	— ⅛
7⅞	6¾	12	4	33½	3¼	N.P.	Darby Petroleum	700	20½	20½	20	20	— ⅜
..	..	2½	74	2¾	1	N.P.	Derby Oil & Refining	100	3⅝	3⅝	3⅝	3⅝	— ⅜
..	..	16¾	4	21⅛	7½	N.P.	Derby Oil & Refining, pfd.	1,200	24⅞	..	..	..	.....
..	..	2	.40	.53	.15	N.P.	Gilliland ctfs.	No sales.					
98	92	118	86¼	165	101⅛	$25	Gulf Oil Corp.	21,600	153½	163⅝	153	159	+ 7⅝
$3.00	.83	2½	.80	3⅜	1	5	Intercontinental Pet.	11,300	1¾	2	1¾	2	+ ⅛
..	..	2¼	1⅛	3	1¼	N.P.	Kirby Petroleum	1,100	2	2¼	2	2¼	+ ⅛
12¼	5¾	10⅞	5⅛	9⅜	5⅛	25	Leonard Oil & Dev.	3,600	5⅜	6⅛	5½	5⅞	+ ⅛
27	20	27½	20	43⅞	20	N.P.	Lion Oil & Refining	1,400	26½	27⅞	25⅝	26½	+ 1⅜
46	30	50⅜	37	69⅛	48⅛	$25	Lone Star Gas	300	71½	72	70½	70¾	— ¾
2⅞	1	2⅞	.80	1⅞	.50	1	Magdalena Syndicate	10,400	70	75	65	65	.....
34	12½	52	12	48½	32	N.P.	Margay Oil	No sales.					
8	5½	12⅛	5	8	2⅜	N.P.	Mexico-Ohio Oil	400	6	6½	6	6	— ⅜
1¾	1⅛	1½	1	1¾	.76	$1	Mountain & Gulf	2,100	1¼	1⅜	1¼	1¼	— ⅛
26	23	29¼	22¾	28⅞	19½	10	Mountain Producers	2,100	19¾	20½	19¾	19¾	— 1⅛
6⅝	5	5⅞	4⅝	5⅝	4¼	5	New Bradford	2,300	4⅛	4¼	4	4¼	.....
..	..	16	9¼	11⅞	7⅛	1	New Mex. & Ariz.	1,200	8⅝	8⅝	8⅛	8⅛	— ⅜
..	..	12⅜	9½	14¼	8½	N.P.	North Central Texas	No sales.					
10⅛	5⅞	9⅝	3¼	6	2⅛	N.P.	Pandem	18,200	3⅛	3¼	2½	2½	— ⅜
12¼	11⅜	12⅛	7	15⅝	8½	N.P.	Pantepec Oil	18,000	8	9⅜	8	9¼	+ ⅜
22¾	12	13½	5⅛	7¾	4⅞	N.P.	Pennok Oil	2,200	4⅞	5⅛	4⅞	5⅛	+ ¼
17	8½	24⅜	7	18	4⅞	25	Red Bank Oil	100	12½	12½	12½	12½	.....
30¼	12	15½	3½	12⅞	4⅛	N.P.	Reiter-Foster	2,700	6½	6¾	6⅜	6⅜	+ ⅛
7	4½	7	4½	12	4⅛	N.P.	Ryan Consolidated	1,400	8¼	8½	8¼	8½	+ ⅜
10	7⅛	8	5¼	7¼	5½	$10	Salt Creek Cons.	800	4½	4½	4¼	4¼	.....
35	24⅛	35½	27¼	35	23⅛	10	Salt Creek Prod.	5,600	23⅝	24¾	23⅝	24	+ ½
6⅞	1¼	7	1¼	3½	1	5	Savoy Oil	600	1½	2	1½	2	.....
27	7⅝	26½	17	22⅞	13	10	Tidal Osage	2,000	12⅞	12⅞	11⅝	12½	+ 1
25¾	7⅝	23¾	15	21¼	13⅛	10	Tidal Osage, nonvoting	1,100	11½	11⅞	11½	11½	+ ¼
92	63½	92	63½	93¾	75	100	Transcontinental, pfd.	No sales.					
8	4½	7⅜	4¼	9⅛	4¾	5	Venezuelan Petrol	4,200	5	5	4⅞	5	.....
8⅛	5½	8	4⅜	8¼	4⅞	$1	Woodley Petroleum	1,400	8⅜	8½	8⅜	8⅜	— ⅛
6½	6	6	1¾	8⅜	2⅛	25	Y Oil & Gas (new)	1,500	3	3⅛	2⅞	3¼	+ ⅛

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of New York Stock Exchange, Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low		Listed capital	Par value	Stocks—	Div. rate	Last paid	Week Sales	Week Open	Week High	Week Low	Week Last	Change
32⅞	24¼	37⅝	27⅝	43⅞	27⅛	(sh)	922,075	N.P.	Amerada Corp.	50cQ	Oct. 31, 28	15,900	..	34⅜	32⅞	33½	— ½
74	39⅞	82⅛	35⅛	85	51¼	(sh)	209,180	N.P.	American Republics Corp.	.....	.....	15,600	..	61⅛	54	54	— 3¼
60	44¾	50¼	35	53⅜	37½		$57,260,300	$25	Associated Oil	50cQ	Dec. 31, 28	4,300	..	44¼	43	44	+ ¾
128⅜	97	131⅜	104	66⅜	50		50,000,000	25	Atlantic Refining	25cQ	Dec. 15, 28	164,600	..	65⅞	61¼	62	— 2¾
33½	23½	35½	20¾	53	20		35,194,000	25	Barnsdall Corp.	50cQ	Feb. 5, 29	2,277	..	46¾	43	43½	— 2½
94¼	50	96¾	65	94⅞	68		20,785,400	100	General Asphalt	.....	.....	13,600	..	71⅞	67½	67½	— 3
72	50¼	175¾	60¼	167	79		25,000,000	100	Houston Oil	.....	.....	29,700	..	105⅞	92¼	96	— 1¾
34	19⅝	32¾	17⅝	38⅜	21¾	(sh)	959,457	N.P.	Independent Oil & Gas	50cQ	Jan. 31, 29	55,300	..	34¾	33	33½	.....
12¾	7½	12⅛	7⅝	39⅝	9		8,203,080	$10	Indian Refining	.....	May 31, 24	250,000	..	43⅜	36	38⅛	+ 2¼
25⅞	16½	37¾	20½	39⅛	27⅜	(sh)	3,992,122	N.P.	Lago Oil & Transport	.....	May 1, 27	5,100	..	31¼	29	29½	— ¾
19⅞	12	18⅛	10	19¾	9⅜	(sh)	1,237,078	N.P.	Louisiana Oil Refining	.....	.....	23,800	..	15	14	14⅛	— ⅞
28	16½	22¾	12	25½	12½	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	2,600	..	17	16	16⅛	+ ¼
63⅜	49¼	58½	31	49¾	33	(sh)	2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	71,700	..	42⅜	39½	39¾	— 1¼
13¾	6	9¼	3	73	4⅝	(sh)	945,939	N.P.	Mexican Seaboard	.....	Dec. 15, 20	142,800	..	56	50⅛	50¾	— 3¼
37	20½	39⅜	25½	44½	25⅛	(sh)	1,357,461	N.P.	Mid-Continent Petroleum	50cQ	Feb. 15, 29	53,100	..	35¾	33½	33¾	— 1¼
104¼	90	105	97	120½	103¼		$6,718,000	$100	Mid-Continent Petroleum pfd.	$1.75Q	Sept. 1, 28	No sales.					
2½	½	3¾	1⅝	7⅜	2⅜		24,298,850	10	Middle States	.....	July 1, 23	26,800	..	5	4¼	4¼	— ⅝
76½	56⅛	65⅞	40⅛	54⅞	38¼		$48,807,400	$50	Pan American P. & T.	.....	Oct. 20, 27	5,200	..	47¼	45⅛	45⅜	— ¾
78⅜	56⅞	66⅜	40¼	58⅞	37¾		121,097,900	50	Pan American P. & T. B.	.....	Nov. 15, 24	66,200	..	48⅛	45½	45½	— 2¼
46	30	37⅞	16¾	28⅜	15½	(sh)	400,000	N.P.	Pan American Western B	.....	Jan. 30, 27	700	..	15½	15	15½	+ ½
32	4½	18⅞	8	21¾	11½	(sh)	198,770	N.P.	Panhandle P. & R.	.....	.....	8,900	..	14½	11½	11⅝	+ ⅛
99⅜	51	83	54	108	70		$2,935,200	$100	Panhandle P. & R. pfd.	.....	July 2, 23	200	..	70	68	70	+ 5
57⅜	40	60¼	36¼	53⅞	35¼	(sh)	2,406,796	N.P.	Phillips Petroleum	37½cQ	Jan. 2, 29	48,800	..	43½	40¾	41½	+ ¾
....	....	1⅛	½	5¼	½		$29,622,925	$25	Pierce Oil Corp.	.....	.....	39,400	..	3⅜	3	3	— ⅛
7	2¼	5½	2½	7	3½	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	12,700	..	5½	5	5	— ¼
60¼	48	55½	45⅝	68	46		60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	22,000	..	64¾	60	60¾	— 3
137½	122½	190	130¾	280	172		$101,250,000	$25	Prairie Pipe	.....	.....	18,100	..	58	56⅛	57¼	+ ¼
20⅜	11	33⅞	16¾	29⅞	16		$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	40	..	23¾	21½	22⅛	— ⅞
41⅜	30⅜	50	36⅞	49⅝	41		2,845,350	50	Producers & Refiners pfd.	.....	May 1, 25	250	..	46¾	42	45	+ 3
31	25¼	33½	25	31⅝	19		75,959,350	25	Pure Oil Co.	25cQ	Dec. 1, 28	78,800	..	27½	25	25¼	— 1¼
27½	22	28⅝	25⅜	56	23		47,025,000	$25	Richfield Oil	.....	Nov. 15, 28	45,800	..	46⅝	43	43½	— 1½
57⅜	47⅜	54½	44¼	64	44⅝	(sh)	611,303	13.40	Royal Dutch, N. Y. shares	50cQ	Jan. 10, 29	4,100	..	52⅞	51⅜	51⅜	— 1¼
48⅝	40½	47⅞	41⅜	57½	40⅝	(sh)	£30,000,000	£1	Shell Transport & T.	$1.455	July 23, 28	1,700	..	46½	46½	46½	— 2½
31	24	31¾	24⅝	39¼	23¼	(sh)	20,000,000	N.P.	Shell Union Oil	35cQ	Dec. 31, 28	1,028	..	29⅞	28¼	28½	— ⅜
28⅝	15⅛	26⅜	14¼	27¼	18⅛		$8,357,000	$10	Simms Petroleum	10cQ	Dec. 15, 28	5,900	..	21⅞	20	20	+ 1⅛
24⅞	16¾	22⅜	15	46¾	17⅜	(sh)	4,501,915	N.P.	Sinclair Consolidated	.....	.....	5,868	..	42½	38⅝	39½	— 2⅜
99½	90	104½	97	110	102½		$16,604,600	$100	Sinclair Consolidated pfd.	$2Q	Nov. 15, 28	5,700	..	110	109¾	110	+ ¼
37⅛	26⅝	37⅜	24⅛	42⅝	25		27,396,590	25	Skelly Oil Co.	50cQ	Dec. 15, 28	29,600	..	37½	34½	35	— 1⅜
63⅝	51½	60¾	50⅜	80	53	(sh)	12,594,098	N.P.	Standard Oil of California	65½cQ	Dec. 15, 28	327,900	..	81¼	72⅜	74⅛	— 1⅜
46⅜	37½	41⅜	35⅛	59⅜	37¾		$611,120,700	$25	Standard Oil of New Jersey	25cQ*	Dec. 15, 28	333,400	..	56⅛	53	53⅜	+ ⅛
47¼	30⅜	34⅛	29¾	44¼	28¾		427,973,275	25	Standard Oil of New York	40cQ	Dec. 15, 28	144,800	..	43½	41	41⅜	— 1⅛
41⅝	30⅛	34⅞	30	77	31½	(sh)	1,206,073	N.P.	Sun Oil	25cQ	Dec. 15, 28	3,800	..	65½	60⅛	61	— 2
5¼	1	6½	3⅛	14¼	2½	(sh)	1,267,000	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	434,600	..	11¼	9½	9⅞	— ½
58	48	58	45	74¾	50		$211,076,650	$25	The Texas Corporation	75cQ	Jan. 1, 29	3,800	..	66½	64½	64½	+ 4
19½	12	18⅞	12	26⅝	12⅛		8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	89,400	..	23⅞	20½	21½	+ ⅝
39¼	27	29⅛	19	41½	19⅝	(sh)	2,168,410	N.P.	Tide Water Oil Co.	20cQ	Dec. 15, 28	5,000	..	34½	33	34	+ ½
103	87¼	90⅛	85	100⅛	86		$20,705,200	$100	Tide Water Oil Co. 5% pfd.	$1.25Q	Nov. 15, 28	800	..	92	90½	91¾	+ 1⅜
27	20⅞	19⅛	15¾	25	14¾	(sh)	4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	74,600	..	21½	20	20¼	— ¼
5½	3	10⅜	3¾	14¾	7¼	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	1,327	..	11½	9⅞	10¼	— ¼
58⅜	37¼	56½	39⅝	58	42¾		$94,798,100	$25	Union Oil of California	50cQ	Nov. 10, 28	22,000	..	52½	50	50	— 1¼
20⅜	84¼	127½	94	128⅛	110		31,061,200	100	Union Tank Car Co.	$1.25Q	Dec. 1, 28	1,700	..	142	136½	137½	— 4⅛
30⅛	23½	34½	24½	44⅞	26	(sh)	356,000	N.P.	Warner Quinlan	50cQ	Jan. 2, 29	7,300	..	38¾	35½	36	— 2⅝
29¾	25⅛	27½	20	38	20⅛	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Jan. 20, 29	5,200	..	37⅞	36	36¾	— ¾
									Wilcox Oil & Gas	.....	.....	19,800	..	26⅞	23	24½	— 1⅞

*Also extras.

STANDARD OIL STOCKS ON NEW YORK CURB

21	16	21⅝	17⅞	22⅜	14⅞		£4,126,460	£1	Anglo-American Oil	.....	June 6, 28	1,417	17	17	16½	16⅞	— ⅛
....	....	3¾	¾	5	1¼	(sh)	500,000	N.P.	Atlantic Lobos	.....	.....	100	2¼	2¼	2¼	2¼	+ ⅛
76	65	69	50	56½	44½		1,000,000	25	Borne Scrymser	$1S.A.	Oct. 15, 28	No sales.					
59½	42	60	45	76	53		10,000,000	50	Buckeye Pipe Line	$1Q	Dec. 15, 28	600	70	70¼	69⅞	69⅞	+ ¼
82½	65	126	76½	161	117½		3,000,000	25	Chesebrough Mfg.	$1Q	Dec. 28, 28	200	160	160	160	160	+12
25⅞	17½	22⅝	16¼	23	16		36,057,840	10	Continental Oil	.....	Dec. 15, 27	55,915	26⅛	28⅜	24⅜	24¾	— 1¾
137	102	137	89	114	67		1,500,000	50	Cumberland Pipe Line	$1A	Dec. 15, 28	No sales.					
63¾	43	68½	47	88	64⅛		5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 28	50	64¼	64¼	64¼	64¼	+ ¼
52½	9⅞	13½	3½	13	4¼		16,000,000	100	Galena Signal Oil	.....	June 30, 25	200	5⅜	5⅜	5⅜	5⅜	+ ⅞
68½	52	68½	54	114¾	59¼		73,117,577	25	Humble Oil & Refining	30cQ*	Jan. 1, 29	28,048	99⅜	110	101⅞	105	+ 2
141½	125½	182	123¾	290½	176½		20,000,000	100	Illinois Pipe Line	10c%S.A.	Dec. 15, 28	350	309½	318	312	317	+ 7
....	....	64¾	37¾	104	56¾	(sh)	6,458,267	N.P.	Imperial of Canada	25cQ	Dec. 1, 28	10,200	93⅛	98¼	90⅛	91⅞	— 3¼
72½	58	94½	61	91⅞	74⅜		$5,000,000	$50	Indiana Pipe Line	$1Q	Feb. 15, 29	1,200	86	89	86	89	+ 4
35½	28¾	39	28¼	55	35	(sh)	7,123,444	N.P.	International Petroleum	25c	Nov. 30, 28	10,300	52¾	56¼	50⅜	51	— 4½
20¾	12½	24	13½	32⅜	19⅜		$6,363,350	12.50	National Transit Co.	25c	Dec. 15, 28	1,900	23⅝	25¼	23¾	23¾	— 1
51½	27¼	44½	31¼	75	38½		5,000,000	100	New York Transit	.....	July 15, 26	No sales.					
80½	64	100	70	69	56½		2,000,000	50	Northern Pipe Line	$3S.A.	Jan. 2, 29	No sales.					
67¾	55¾	67⅞	52	84	58½		60,000,000	25	Ohio Oil Co.	50cQ*	Dec. 15, 28	5,800	67	70½	67	69½	+ ½
24¾	15	39	12	84	28		10,000,000	25	Penn Mex. Fuel	$1.25	Dec. 15, 28	900	35	35	30½	31⅞	+ ⅜
220	84½	201½	175½	220	167		4,000,000	100	Solar Refining	$5S.A.	Dec. 20, 28	500	39½	42	39½	42	+ 3¾
74½	61½	27¼	15½	19	15		1,000,000	10	Southern Pipe Line	$2	Dec. 1, 27	1,100	17⅝	18⅝	15½	15½	— 1½
50	34½	41½	35	71⅞	36¾		2,000,000	25	South Penn Oil	50cQ	Dec. 31, 28	8,800	44	48⅝	43⅝	46¾	+ 3⅛
56	47½	83	55½	102	70		3,500,000	100	Southwest Pa. Pipe Lines	$1Q	Oct. 1, 28	150	66	67	66	67	.....
70½	60½	81½	64⅝	95⅞	70⅞		228,415,463	25	Standard Oil of Indiana	62½cQ	Dec. 15, 28	26,600	90½	93¼	89	92⅜	+ 1¾
36½	16½	20⅞	14⅝	27¾	15		8,000,000	25	Standard Oil of Kansas	.....	June 16, 24	900	21	21	19¾	19¾	— ¼
134⅜	108	130	111½	179¾	122¼		17,012,559	10	Standard Oil of Kentucky	$1Q	Dec. 31, 28	15,100	41	42½	40⅜	40⅞	+ ¼
51⅛	42	49½	40	54⅞	39⅞		4,559,850	25	Standard Oil of Nebraska	63cQ	Dec. 20, 28	400	47⅞	48⅜	47½	47½	.....
72	288	87½	72	134	71		14,000,000	25	Standard Oil of Ohio	62½cQ	Jan. 2, 29	500	115	118½	114	117	+ 2
21	15	21	14½	23½	16		861,000	25	Swan Finch Co.	.....	Nov. 1, 19	100	15	15	15	15	.....
109⅜	90¼	....	....	111	72		125,619,000	25	Vacuum Oil	75cQ	Dec. 20, 28	18,300	128	133¾	121¼	128½	+ ½

*Also extras.

ne, which has increased its capacity.

"We also have completed laying 11 iles of 12¾-inch line from our main ne at Wharton to Boling, or Newgulf, Wharton County, where Texas Gulf ulphur Co.'s new sulphur mine is lo- ted. With this new business from exas Gulf Sulphur and settlement of he Galveston rate controversy, which should bring about increased deliveries by the pipe line company to the company distributing gas in Galveston, it is expected that our gas deliveries will show an increase of about 15,000,000 feet a day.

"During the year, company sold $8,000,000 10-year sinking fund 5½ per cent convertible notes, proceeds of which were used primarily to retire outstanding 6½ per cent notes which were issued in financing the gas lines of Houston Pipe Line Co."

Gulf Oil Corp.

Gulf Oil Corp. spent $49,600,000 in 1928 for properties, plant and equipment, according to W. L. Mellon, president, in 1928 annual report. Principal items of investment were additions to leaseholds, enlarging pipe lines and storage pipe lines and storage system, including 10,000 bbls. additional pipe line capacity from Oklahoma to Port Arthur, Tex. The refinery at Philadelphia was enlarged and additions were made to the tanker fleet and distribution system.

(Continued on Page 152)

CROOKED HOLES NEXT IMPORTANT PROBLEM

(Continued from Page 38)

of the ground—truly, for the satisfactory solution of these engineering problems we must either drill our holes vertical or we must know their real location underground.

There is little question that many of the reported cases where offset wells exhibit remarkable effects of production rise or fall, as if the sand were very porous between the two or as if they were connected by open channels—that many of these cases are due to the close proximity of the wells at the pay sand depth.

One of the lines of scientific research, now under serious investigation, which promises to be of practical value as an index to subsurface uplifts, concerns temperature measurements in wells. Those who are engaged in this research are naturally anxious to secure records in deep wells. Unless they know the vertical depths of their points of measurement and the actual positions of these points on the structure, many of their readings, and particularly their deep readings, are going to be much in error.

It is plain that a wildcat well, located on structure, might easily drift off and miss an oil-bearing sand, especially where drilling is deep.

Effects of Errors

In a hole which has acquired even a moderate angle of inclination from the vertical, erroneous estimates of the thickness of the formations penetrated are possible, and, consequently, incorrect figures may be given for casing seats in subsequent wells; the oil sand may be partly or wholly cased off; or, on the other hand, a water sand may not be completely shut off.

Subsurface contour maps are based on the assumption that the key horizon was penetrated vertically below the mouth of the well. The elevation of the key horizon in each well, either above or below sea level, is obtained by referring this assumed vertical depth to the sea level elevation of the mouth of the well. If the hole is crooked an error is introduced into the calculated elevation of the key horizon, and this error may be quite large. In the Seminole Field, the greatest recorded vertical discrepancy at a depth of 4,000 or 4,100 feet was 798 feet.

No doubt in a majority of wells, taking into consideration all producing regions, this vertical error is relatively small; but it may be large without any suggestion of crookedness of the hole in drilling. Consequently holes should be surveyed for satisfactory contouring. The vertical error should not be greater than the contour interval. In maps covering small areas, or single pools, drawn on a large scale, considerable errors may creep in, unless, as is commonly the practice, the data from "freak" wells are omitted, but regional maps, constructed on data from wells which are several to many miles apart, suffer very little from the incorrect values obtained in crooked holes. The holes must be deep and far off the vertical to cause any serious misconstruction. And in any event, such maps are always properly used and read with an open mind.

Orientation of Cores

A phase of this problem in which the geologist is vitally interested, not for the mere scientific information which it may give, but for the very practical value which attaches to it, is the correct orientation of cores. In diamond drilling for hidden structure, cores are obtained for study. In our modern rotary drilling, most companies require cores at frequent intervals. Even in cable-tool drilling, devices are being perfected for securing cores. Generally, it is true, these cores are used for simple correlation from well to well; but where they exhibit stratification or cleavage or faulting or other similar rock features, we should be able to orient the cores. If the hole was vertical, we ought to know which part of the core faced north. If the hole was inclined, we ought likewise to know its azimuth and which part faced upward, toward the "hanging" side of the hole, to use a mining term. Very valuable information could often be secured if we could determine the orientation of such cores.

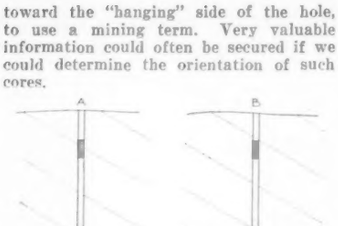


Figure 23.

As a suggestion of problems of this type, we have drawn Figures 23 and 24. In Figure 23, the hole was drilled in inclined strata. Cores taken at four points all revealed dips of about 30 degrees. Without being able to determine the orientation of these cores, A would probably have been the interpretation; but the true relations, brought out by knowing the real position of the cores in the hole, are shown in Figure 23, B.

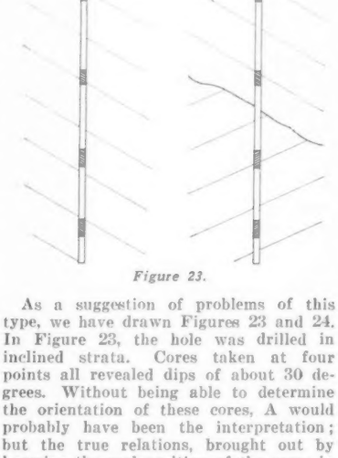


Figure 24.

Figure 24 illustrates a problem which actually occurred. A well was drilled on a flat dome. At a depth of about 3,500 feet it abruptly passed into a series of beds with relatively steep dips which remained nearly constant to the bottom of the hole at about 4,000 feet. Assuming that the hole is vertical, did this lower series of beds dip west (A) or east (B) or in some other direction? If an oriented core had been obtained, the operator would have known which way to go to drill into a higher part of the structure in this deeply buried formation.

The study of cores for their orientation and the determination of the direction of true dip is not easy. For instance, (1) in a vertical hole penetrating horizontal strata, the lamination is at right angles to the axis of the core. If (2) the beds are horizontal and the hole is inclined, the angle between the axis of the core and the lamination is equal to the inclination of the hole. If (3) the beds dip, let us say, 30 degrees due south, and the hole is vertical, the lamination in the cores makes an angle of 30 degrees with the axis of the core. But, unless the angle of deviation of the hole is known in case (2) and unless the orientation of the core is known in case (3), we cannot interpret the dip in the core.

Now suppose that (4) the beds dip 30 degrees due south, as in case (3), and the hole is inclined 30 degrees off the vertical in a due north direction, the core will show lamination perpendicular to its axis, as in case (1). Or, (5) the hole may be inclined more than 30 degrees from the vertical in a due north direction, or (6) less than 30 degrees due north, or (7) at an angle of less than 30 degrees from the vertical due south.

These are all comparatively simple cases, for the hole is inclined in the plane of the dip of the strata. The real difficulty lies in the fact that extremely few crooked holes are inclined in the plane of the dip of the bedding, even in the short length of hole from which the core came.

I am stressing this topic because I am thoroughly convinced that oriented cores ought to be secured from drilling wells, but in order to secure them the hole must be surveyed as to both its angle and its direction of deviation from the vertical.

Surveying of Crooked Holes

Quantities to be Measured, and Devices for Measuring—In the present paper there will not be space to enter into detail regarding the mechanism of the many kinds of instruments devised for surveying crooked holes, nor for describing the methods of calculating results. We intend only to outline the principles involved.

The quantities to be measured or surveyed are:

1. The angle of deviation of the hole from the vertical, determined at any given point or points along the course of the hole.
2. The direction, or azimuth, of this vertical angle of deviation, measured at any given point or points along the course of the hole.
3. The position of any such point or points in the hole, relative to fixed points on the ground.
4. The true attitude of bedding or other similar geological features, from correct orientation of cores.

For determining merely the angle of deviation of a hole, the following devices have been used or suggested:

1. "Acid bottle," i.e., a bottle partly filled with hydrofluoric acid and water commonly in the proportion of 1 of acid to 3 of water.
2. Two pendulums pivoted to swing in vertical planes at right angles to one another; or one pendulum swung on a universal bearing.
3. A level bubble.
4. Mercury, making electrical contacts.
5. Principle of the Wheatstone bridge.

Measuring Direction

For measuring the direction of deviation of a hole, the following instruments have been used, generally in combination with one or another of the devices mentioned above.

1. Electric lights lowered into an open hole.
2. A drill stem carefully surveyed as to its azimuth at the mouth of the well.
3. A magnetic compass.
4. A gyroscopic compass.
5. Inertia of a heavy rotating body.

For recording one or more of the quantities measured by the instruments just cited, the following means have been utilized:

1. Photographic apparatus.
2. Bristles or clamps which are set at the proper time.
3. Pin pricks on a continuous tape, or on the record forms.
4. Gelatin or other similar substance which congeals about, and thereby sets in position, such a device as a compass needle.
5. Accurate surveying at the mouth of the well.

To operate some of these mechanisms, the following have been used:

1. Electric current, generated by a battery which is lowered into the hole.
2. Electric current carried from the ground surface by wires suspended in the hole.
3. Clockwork, timed to register automatically at the required depth, or depths.
4. Rotation of the drill stem.

For ascertaining the position of any point in a hole, some suggestions have been made or experiments have been conducted along the following lines of seismographic observation:

1. Setting off charges on surface, with seismograph in hole at required depth.
2. Setting off charge in hole, with several seismographs properly station[ed] around hole on surface.
3. Seismographic or geophonic re[cord]istering of vibrations caused by drilling, especially cable tool drilling, the instru[ments] being placed at suitable distance[s] from the mouth of the hole.

Description of Instruments and Metho[ds]

1. The Acid Bottle Method—T[he] simplest apparatus in use for determ[in]ing the angle of deviation of a hole [is] the "acid bottle." A small quantity [of] dilute hydrofluoric acid is poured into [a] glass bottle which is then tightly cork[ed] with a rubber stopper. The bottle [is] lowered into the well in a suitable co[n]tainer, commonly a length of steel pi[pe] which can easily be made small enou[gh] to run in a 6-inch drill stem. This co[n]tainer is securely capped and seal[ed] against leakage from without. It is lo[w]ered in a few minutes at the end of [a] steel line, and is allowed to rest at [the] selected depth for 15 or 20 minutes, du[r]ing which time the acid dissolves awa[y] a thin layer of glass, leaving a shar[p] line at the edge of the liquid. If th[e] hole is inclined, this line is inclined, a[nd] its angle can be measured in the bott[le] after this has been withdrawn from th[e] well and the acid poured out. The meth[od] is simple, but it is rather messy becau[se] rubber gloves are necessary and gre[at] care must be used lest the acid injur[e] one's hands or clothing. Unless suffi[cient] precautions are taken, the bottle may be broken either by jarring in ru[n]ning in or running out or by the hi[gh] pressures at great depths.

2. Briggs' Electrical Method—Pr[of.] Henry Briggs, of Edinburgh, invented [an] electrical method of surveying bore hol[es]. A small vessel containing a highly r[e]sistant liquid is lowered in the hole a[nd] a similar device is on the ground, t[he] two being connected by insulated wir[es]. At the end of a pendulum, a needle, [in]cluded in the electric circuiting, is fr[ee] to swing in the liquid in the lower i[n]strument. In each vessel are four ele[c]trodes, marked N, E, S and W. T[he] orientation of the lower vessel is kept co[n]stant, according to the inventor, due [to] the fact that it is attached to the dr[ill] rods which are oriented at the surfa[ce]. According to the principle of the Whe[at]stone bridge, variations in the resistan[ce] ratios between the needle and the fo[ur] electrodes in the lower instrument, due to shifting position of the needle wh[en] the penedulum swings off center, as in [an] inclined hole, can be duplicated in [the] upper instrument by shifting a need[le] connected to the circuit, in the liquid [of] this upper instrument until zero indi[ca]tions are obtained by the recording devi[ce]. This device may be a galvanometer wh[en] d.c. is used, or a telephone receiver wh[en] a.c. is used.

The advantage of this instrument l[ies] in the fact that it will give continu[ous] readings of angular deviation of the ho[le] from the vertical. Its disadvantages a[re] the necessity for insulated conductors [in] the hole and, azimuth readings, the [use] of an oriented string of rods.

Electric Lights

3. Use of Electric Lights—In W[est]ming, in cable tool holes, the practi[ce] of suspending electric lights every [few] feet of depth, down to 400 or 500 fe[et] has resulted in doing away with much [of] the trouble formerly experienced with [the] tendency of the holes to go crooked. [If] the hole is off plumb, as indicated [by] the light, it must be plugged back [to] straightness and redrilled. The operat[ors] have learned that, if the hole is made ab[so]lutely vertical at 500 feet, and the co[n]ductor is vertical, there is very lit[tle] chance that it will deviate much as [it] is drilled deeper.

4. The Maas Compass—An instrume[nt] which has long been employed in surv[ey]ing diamond holes, chiefly in mining di[s]tricts, is the Maas compass, invented [by] E. E. White and George Maas. It co[n]sists of a small magnetic needle swingi[ng] on a pivot attached beneath a small co[rk]. This cork is floated in hot liquid gela[tin] in a bottle which is lowered in the w[ell] in a brass case screwed to one or t[wo] joints of brass pipe. The brass tubi[ng] can be screwed to the lower end of [a] full string of steel rods, or it can be [al]lowed down by a cable. When lowered to

scribed depth, the apparatus is allowed o hang stationary long enough for the elatin to harden, and so set the com- ass needle. The attitude of the surface f the gelatin may give an approximate dea of the angle of deviation, and the ompass needle shows the direction. If referred, the acid bottle may be used n combination with the Maas compass.

5. MacGeorge's Method—MacGeorge's elatin method includes the Maas com- ass in one bottle and a plummet in a econd bottle. Both the needle and the lummet are suspended in gelatin.

6. Oehman's Apparatus—A more pre- entious affair was invented by Oehman. t was widely used in South Africa. It ncludes a battery, a clock, and photo- raphic apparatus. The clock at a fixed ime, completes an electric circuit which urns on an electric light and photographs he position of a plum-bob and compass eedle. Pin pricks mark the orientation f the photographs.

7. Oriented Drill Stem Methods—In 873, one Oswald J. Heinrich suggested hat oriented cores might be secured, in iamond drilling, by using a flat rope hich, he said, "would not twist." This perhaps the first application of a sus- ended "string," oriented at the surface ith the object of determining orienta- ions at depth in the hole. He recom- ended hoisting carefully and noting the rientation of the core barrel on arrival t the surface. He was probably over- ptimistic in his assumption that the flat ope would not twist.

Orienting Drill Rods

Many years later a method for orient- ng drill rods was proposed by John eacon, of Michigan, for use in diamond rill holes, where magnetic rocks were nown to be present in the formations. he rods to be run in the hole were irst laid out on the ground and screwed ightly together. The joints were then arked where they met, on top of the ipe. Next the stem was unscrewed at very second joint and was built up again nd run into the hole in just the same rder, watching the marks with care, as he couples were screwed up. At the ower end of the stem was attached a oint of pipe containing an acid bottle. he statement is made that, when the ole was straight the results were good, ut if the hole was deep and crooked, he results might not always be satis- actory. In surveying the hole in this ay, the pipe was raised and lowered few feet several times to take out any ossible twist.

The most recent application of the riented drill stem method is that in- ented by Alexander Anderson. It has een widely used by companies in Cali- rnia during the last three years. Just hat the internal mechanism of his ap- aratus is few people know. We have een told that it contains one or two endulums. The position of the pendu- ums is said to be recorded by photo- raph. The apparatus including the pen- ulums, photographic equipment, and iming and actuating devices is all con- ained in a water-tight casing which is onstructed to be run into the well on he end of a string of drill pipe or tub- ng. The direction of inclination of the ole is determined by careful surveying f the drill stem or tubing at the mouth f the well, both in the lowering and, or a check, in the lifting of the pipe. o quote from Anderson, "With the tandard apparatus, 88 consecutive read- gs for inclination and direction of in- lination may be taken during one lower- ng into the well. One reading is gen- rally taken after each stand of pipe is owered, or say, about 12 readings per 000 feet of hole. Usually 12 readings er hour are taken in a well."

Experiments with an oriented drill tem were tried in Texas, using acid bot- les placed in the upset of the tool joint t every fifth fourble. The joints were crewed tight and the lower end plugged ith babbitt metal to keep out water and ud. Although the drill stem was built p as rapidly as possible, two hours ere consumed in running in. After all he bottles were in place, the stem was llowed to stand for four hours. In break- ng out the drill stem, a target, marked ff in degrees, was attached to the up- per end of each fourble, close to the der- rick floor. This was accurately surveyed, the stem was then hoisted, and the same target was again surveyed to correct for lean and rotation, at the fourble board, before unscrewing. At the same time an- other target, which was attached to the upper part of the fourble previously hoisted, was lowered and fastened to the next fourble at the derrick floor. The position of each bottle was accurately determined in relation to the drill stem.

In the Ceptura Field in Rumania a very similar method has been tried with some success.

Martienssen's Method

8. An instrument used by Dr. O. Martienssen in Germany consists of two pendulums pivoted at right angles to one another, recording apparatus for each pendulum, a gyroscopic compass, and electrical equipment employed in actuat- ing the recording device, driving the gyroscope, and turning the metal housing in which all these contrivances are con- tained. Orientation is governed by the gyroscope according to the well known principle of Foucault. The inner housing is inclosed in a strong water-tight outer casing. The turning of the inner housing is controlled electrically by the gyroscopic compass, being so designed that the in- closed pendulums, fixed with respect to the housing, are always oriented to swing in east-west and north-south planes. The instrument is lowered by cable. Insulated conductors, incorporated in the cable, carry the electric current from the ground surface to the apparatus. In actual use, the instrument is slowly lowered, with the gyroscope rotating and thereby keeping the pendulums always oriented. At every 10 feet (or any other desired interval) a telegraph key is de- pressed by the operator, thus causing an armature to press a fine needle into the record paper associated with each pen- dulum.

Rieber's Method

9. Frank Rieber of San Francisco, has improved upon a device built by Dr. G. D. Hanna, who in 1926 con- ceived the idea of using the inertia of a heavy mass, mounted inside the drill stem, for controlling the unlock- ing and relocking of a compass and a plumb bob. In Rieber's instrument there is a pool of mercury in a steel case and in this mercury is a four-bladed steel paddle, its shaft extending up and outside of the case. When the drill stem is rotated, the paddle starts the mercury whirling, and when the drill stem is stopped, the mercury continues to whirl for some time. Through an ingenious mechanism, which utilizes the effect of the reversed rotation of the retarded drill stem, provided the mercury acquires suf- ficient speed, a train of clockwork is tripped into action, and this in turn re- leases the compass needle and the plumb bob, each of which, after coming to rest, automatically punches its position on an aluminum disc. A third mark registers the position of the disc relative to the case and drill stem. Thus a record is obtained of the direction and angle of inclination of the hole.

For each reading a new disc is mechani- cally brought into position, the old one being removed to a receiving chamber.

Defects and Limitations in Surveying

It may be worth while mentioning here some of the more obvious criticisms which may be made of the methods of surveying holes. In some cases the ques- tion concerns merely limits of accuracy, while in other cases more serious diffi- culties may be present. For instance, the small angular errors which may be due to the particular position of the sur- veying instrument in the hole, or which may be due to capillarity in the acid-bot- tle method, are not important, for it is doubtful whether the exact angle of de- viation of the hole from the vertical, to an accuracy of less than, let us say 1 degree or 1½ degrees, is generally possi- ble of attainment.

On the other hand, the objection raised against the magnetic compass, that it is subject to irregular deflection in strata containing magnetic or other magnetic substances, is reasonable. However, this objection has been largely overruled by experience. In numerous instances, in mining regions where there is no magnetic ore, the records obtained by the Maas company have been proved to be essentially correct by subsequent mine excavations. Magnetic substances seldom occur in sufficient quantity in regions where oil is produced to have any notice- able effect on the needle. Such effects would be local in any event and would probably be detected without difficulty because of their irregularity compared with the majority of the readings made in the hole. To reduce the chance of mistakes as far as possible readings by the magnetic compass may be made at two or three points a few feet apart, at each selected depth of observation.

An important objection which has al- ways been raised against the use of any instrument having a magnetic needle lies in the fact that the needle may be af- fected by the iron pipe in cased holes. However, according to some recent ex- periments we are told that in some cases the magnetism in a string of pipe may be concentrated at the ends of the string. That such is always the case seems doubt- ful, but remains to be demonstrated.

Orientation of Pipe

To many engineers the idea that a long string of pipe, suspended by its upper end, will always maintain a constant orientation throughout its length, as it is built up joint by joint, at the surface of the ground and lowered into a hole, is difficult to conceive. The fact that the threading is all in one direction and the fact that the iron or steel of which the pipe is made cannot be quite homogeneous in character, lead one to believe that, as more and more weight is added by build- ing up the string, unequal strains are in- duced, which will ordinarily result in a net twist of the lower end of the pipe, either in a clockwise or a counter-clock- wise direction, as the case may be.

This is one suggestion. Another along the same line, is that, due to the bent shape induced on a string of pipe sus- pended in a crooked hole, and also due to friction against the walls of such a hole—in each instance more particularly where the curvature of the hole is not all in one vertical plane—the lower end of such a string of pipe is not likely to maintain its original orientation with increasing depth.

Very few tests have been undertaken to demonstrate whether these suggestions are valid. We have heard of one case in Germany where, out of eight measure- ments made by an oriented string of pipe to a depth of less than 1,000 feet, six were eventually proved to be correct and two were shown to be in error because of the twisting of the pipe. Other tests have been made by the use of acid bot- tles placed in a drill stem, to demonstrate that the stem is rigid. Thus, the bottles, when withdrawn, showed that 2,600 feet of drill stem had rotated throughout its length as many degrees as the angle through which it was turned on the der- rick floor; but this in no way proved that the lower end had not acquired a twist in going into the hole, a twist which would disappear in coming out of the hole, and therefore a twist which could not be measured from any observa- tions at the surface.

Is not this a problem which ought to be solved? We have recommended mak- ing a study of the behavior of a string of pipe suspended in a vertical mine shaft. We would now suggest further— and this applies to any instruments in- tended for surveying both the direction and angle of inclination of holes—that wherever holes run together, efforts be made to secure the privilege of surveying and checking the results in both holes. These surveys ought to show intersection of the holes.

As regards the gyroscope, it has its defects which can be explained only by a physicist in terms beyond our ken. One important objection is that it is extreme- ly delicate, and a second lies in its com- plexity and high cost of manufacture.

Methods of Taking Oriented Cores

Several methods have been devised for taking oriented cores. One of these is as follows: A small rathole is drilled at the bottom of the larger hole and an in- strument constructed to register angle and direction of inclination is firmly placed in the rathole. After a sufficient time has elapsed, a large core barrel is run into the hole, and a core is secured by cutting round the instrument. The core and the instrument are then with- drawn together for study.

In California, George A. Macready has invented a core barrel equipped with plumb bob, magnetic compass, and pho- tographic apparatus.

In conjunction with Doctor Martiens- sen's gyroscopic apparatus, he has an in- strument for making the bottom of the hole in such a way that, when a core is subsequently taken, its position can be determined relative to the instrument and therefore relative to compass directions and the vertical.

Rieber's apparatus can also be used for determining the orientation of cores.

Causes of Crookedness

The causes of the deviation of holes from their desired course may be classi- fied as geological and mechanical. The geological causes, however, are unavoid- able. They are conditions which cannot be altered, but which demand recognition, for they can be overcome only by proper methods of drilling.

Geological Causes

Among the geological conditions which may cause a hole to deviate from the vertical are:

1. The presence of "boulders" or con- cretions which, if encountered at an an- gle, tend to deflect the bit.
2. The dip of the bedding, particular- ly if the strata consist of alternating hard and soft layers.
3. The presence of fissures, faults, or veins, which offer either considerably more resistance or considerably less re- sistance to penetration by the bit than the rocks in which they occur.
4. The presence of caverns or other open spaces.
5. Caving and heaving of rock mate- rials when exposed during drilling.

Mechanical Causes

Following are some of the mechanical causes for the crookedness of holes:

1. Starting the hole off the vertical.
2. Using poor material.
3. Use of bit not best adapted to the conditions.
4. Use of bit with too much cutting clearance.
5. Spudding the bit.
6. Use of too small a drill stem.
7. Bent of corkscrew form of drill stem, with resulting rubbing of sides of holes.
8. Too much clearance between drill stem and hole.
9. Sidetracking.
10. Use of mud of wrong consistency.
11. Use of big pumps.
12. Coring or ratholing, or otherwise reducing hole, where sufficient precau- tions are not taken to center the small hole and keep it straight.
13. Application of too much pressure on the bit.

Effect of Weight

Most of these causes, as stated, are self-explanatory. One or two of them deserve a little discussion. Practically all those who have given much thought to the problem of crooked holes are agreed that one of the principal causes is excessive pressure on the bit. In other words, not enough of the weight of the drill stem is lifted off the cutting sur- face of the bit. As a consequence the drill stem may be bent, especially when the diameter of the hole is considerably more than the diameter of the drill pipe, and where, for one reason or another, the hole has become abnormally enlarged. Drillers with whom we have talked are of the opinion that holes—we are speak- ing now chiefly of rotary holes—begin to deviate from the vertical between 500 and 1,000 feet below the surface. Some of them claim as high a level as 250 or 300 feet. Why is this? Is it because the weight of 500 or 1,000 feet of drill stem is perhaps as much weight as should be applied to the bit while in operation. With ordinary 25-pound, 6- inch pipe, this weight, for a complete drill stem and 11-inch bit, in a hole 1,000 feet deep, would be about 32,900 pounds, after deducting for buoyancy due to the mud, assumed to weigh 10 pounds per gallon. For 22-pound, 6-inch drill stem

with an 8-inch bit, this figure would be about 30,400 pounds. However, we know that much greater weights are used. R. S. Cartwright suggested 38,000 pounds as the most efficient weight for all formations. Possibly this will be proved to be too great, when we have learned more as to what weights are most satisfactory.

Another potent factor in causing holes to turn out of line is the hydraulicking action of the mud where it is forced out of the bit. Many drillers admit that, in soft formations, the "drilling" amounts to little more than jetting the hole down. The force of this jetting action as it comes out of the small holes in the bit must be tremendous where 400 or more gallons are being pumped down every minute. By this hydraulicking, undoubtedly wide openings are sometimes cut, instead of a clean cylindrical hole of uniform diameter, and these openings afford ample opportunity for the drill stem, under pressure, to bend out of the axis of the hole. Furthermore, the jetting, or hydraulicking, may wash out the bottom of the hole off center and so lead the bit astray.

We believe that these two factors of excessive weight on the bit and excessive speed of circulation are most important in causing the crookedness of holes. Most of the other factors are contributary, but under properly controlled pressure and circulation and with adequate equipment, these other factors can be largely overcome.

Remedies for Deviation of Holes

Wherever possible the geologist should, of course, warn the driller of any known contacts between formations of very different resistances to the action of the bit, and of any known faults, or other similar features. But the best warning is, expect these features anywhere. Drill in a manner best suited to overcome these unknown conditions whenever they occur.

Since geological conditions which may favor the deviation of holes can neither be altered nor predicted, except in a general way, the opportunity for correcting the defect rests almost entirely with the driller. If the driller or the drilling contractor is told that he must reach the pay sand, or any specified depth, in the shortest possible time, then those who gave him this order are to blame. First, then, those who are responsible for rushing the drilling must be disillusioned. They must learn that less speed with a more perfect hole is, in the long run, most economical.

If excessive pressure on the bit and hydraulicking are the principal mechanical causes of crooked holes, we must make serious efforts to better these conditions. Weight indicators should be installed. Probably improved indicators can be made, and more satisfactory bits can be designed. In any event these phases of drilling should be carefully and intensively studied.

Clearence of Drill Stem in Hole

To reduce the risk occasioned by too much clearance between the drill stem and the hole (whether open or cased), several contrivances have been used or suggested. Rubber collars may be placed at intervals, generally on every joint or every other joint, on the drill stem when it is rotating inside casing. They were supplied to protect the drill collars, but they also serve to center the pipe. Some success is claimed by drillers who have placed a roller reamer just above the bit and another one or two joints higher up in the drill stem. In reducing a hole, a diamond-point bit is sometimes used to drill a conical bottom to the hole, so that the smaller bit will start in a central position. However, in ratholing and coring, precautions are seldom taken to center the small hole. Frequently the drill stem is made up with several joints of the next larger size of pipe at the lower end of the string. None of these methods are entirely satisfactory for all conditions and most of them lose their efficiency if too much pressure is applied in the drilling.

Permissible Angle of Deviation

The most concerted effort to remedy the drilling of crooked holes has been made during the last year in the Seminole Field in Oklahomn. Here so many holes wandered so far from the straight and narrow path that the operators simply had to sit up and take notice. And they have done so with effect. The contractors are admitting that they can drill straighter holes, but they say it costs them about $2,500 more per 4,000-foot well. In some cases they are writing contracts which require the plugging back and redrilling of holes which are found to deviate more than 10 degrees or 15 degrees from the vertical. For example, the following is quoted from the rotary drilling contract now being used by one company (the first party) with its drilling contractors (second party):

"First party shall have the right at any time it may desire to make a survey of the well to determine the condition of the hole, at the risk and expense of second party. Such survey shall be made by such method as first party may desire. When such test is made and the hole is found to deviate as much as 15 degrees from perpendicular, first party may require second party to redrill said hole at second party's expense. If after completion of said well it is surveyed and found to exceed 15 degrees variation from perpendicular, it shall be optional with first party whether or not it accepts the hole, and in case of nonacceptance first party shall not be liable for any expense connected with drilling said well and will be under no obligation to second party."

The question has arisen as to whether 10 degrees or 15 degrees or some other angle is suitable as a maximum permissible limit.

It is questionable whether, in the drilling, any angle of deviation can be safely permitted much greater than the angle which, at any given depth would eventually displace the bottom of the hole more than half the offset distance away from the vertical through the mouth of the hole. The fact that crooked holes do not turn off sharply and then maintain a straight inclined course, but instead bend more or less gradually and drift in a horizontal sense, means that the conditions illustrated in Figure 33 are extreme. Consequently, if these conditions are taken as a basis for estimate, as we have done, a little more latitude in vertical angular deviation can be allowed without danger.

Advantages of Oriented Whipstock

Where a hole is found to deviate as much as the permissible angle, according to the clause quoted above from a drilling contract form, some of the Oklahoma operators have required that the hole be plugged back to the part known to be vertical and then that it be redrilled. This method has met with some success; but it is rather haphazard and unscientific, for the second hole is as likely to be crooked as the first, starting as it does against a hard cement plug. A much more practical plan would be to set a properly oriented wedge or whipstock at the bottom of the crooked hole, and then continue drilling, in this manner saving the cost of plugging back and redrilling and saving the risk of drilling the second hole crooked.

On the assumption that it is possible to measure the direction and angle of deviation at any point in a crooked hole, then there is no mechanical reason why a whipstock cannot be set in any azimuth desired and at any depth desired, provided the right kind of equipment is available.

Oriented wedges for correcting deflection have long been known and used in diamond drilling. A method conceived by a Mr. Mellon, and improved and used in South Africa by A. Payne Gallwey, has been described by John I. Hoffman. In Germany, Dr. O. Martienssen has also devised a method of wedging holes back toward the required position.

Conclusion

In conclusion, then we would emphasize this fact, that, whether the immediate effects of crooked holes are excess of footage drilled, or twist-offs, fishing jobs, and other adversities in drilling, or wear and loss in pumping and other producing operations, or misinterpretation of geological data, or erroneous results in production engineering problems, the final consequence is financial loss. And the difficulties and the losses are going to be greater, the deeper we drill for oil. We must learn how to drill holes vertical and we must improve the accuracy of our subsurface information by securing correct surveys of the underground courses of holes and by establishing the correct orientation of cores from these holes.

Once again, as so often in the past, the industry is forced to admit that, in the long run, careful scientific methods, rather than hit-or-miss untechnical methods, are most economical, and therefore most practical.

Acknowledgments

In the preparation of this paper the writer has been assisted by the very willing co-operation of many gentlemen who have been most kind in furnishing data and making suggestions. It is impossible to name here all those to whom thanks are due, but we do want to express our gratitude to the following persons who have gone to much trouble to assist us: Messrs. Morris C. Allen, Alexander Anderson, G. E. Dorsey, J. E. Elliott, G. C. Gester, H. B. Goodrich, E. J. Gorman, H. B. Hill, H. H. Hill, P. S. Justice, A. A. Langworthy, R. S. McFarland, Desaix B. Myers, R. Van A. Mills, Wilson K. Page, Sidney Powers, John A. Ritter, D. R Snow, C. Beeby Thompson, W. W. Warner and Luther White.

OIL SECURITIES SHOW VERY GOOD STRENGTH

(Continued from Page 149)

Additional investment of $5,000,000 was made in foreign marketing through the purchase of stock interest in the Nobel-Good-Andre group, operating in England, France, Belgium, Germany, Holland, Italy and the Scandinavian countries, principally distributing and selling lubricating oils. Gulf Oil previously had a 25 per cent interest in these properties and this purchase gives it a 75 per cent interest. Of the payment, $2,200,000 was made by delivery of 57,601 shares of the Gulf Oil Corp. at the market price of $125 a share July, 1928.

Company operated 5,700 producing oil wells in Kansas, Oklahoma, Texas, Louisiana, Venezuela and Mexico, and these yielded an average of more than 202,800 barrels of crude oil, gross, a day in 1928. Total gross production was 74,248,793 bbls., of which the Gulf Oil Corp.'s net portion was 63,062,800 bbls., daily average of more than 172,300 bbls.

Mr. Mellon states the large gain in production of crude oils containing a large amount of sulphur requires substantial expenditures to change and add to plants to more economically refine crude. This factor, along with the necessity for increasing the company's marketing facilities causes the management to continue its policy of retaining surplus earnings for reinvestment.

The first stock purchase plan, permitting employes to subscribe 20 per cent of their salary over five years ended September 30, 1928, with 9,935 employes receiving 203,746 shares of stock and $623,323 in cash. A second plan running for three years from October 1 is available to permanent employes up to 10 per cent of their compensation and 15,340 employes have subscribed to this.

Report of the Gulf Oil Corp. and subsidiaries for year ended December 31, 1928, shows net income of $36,325,140 after interest, depreciation, depletion, taxes, minority interest, etc., equivalent to $8.06 a share (par $25) earned on 4,504,921 shares of stock. This compares with $13,707,627 or $3.08 a share on 4,450,116 shares in 1927.

Twenty Representative Stocks

The Oil and Gas Journal weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Saturday, was as follows:

January 26	57.44
February 2	57.55
February 9	55.28
February 16	55.35
February 23	54.92
March 2	56.43
March 9	55.96
March 16	58.63
March 23	58.52

WEST TEXAS FIELDS

(Continued from Page 44)

Block 19, was dry and abandoned at 3,16[illegible] feet.

Jones County

Marland Production Co.'s No. 7 Mason, 330 feet south and 990 feet west of NE cor. of S half NE Section 18, Block 19, T.&P. Survey, made 76 bbls. at 2,512-2[illegible] feet. Phillips Petroleum Corp.'s No. [illegible] Mason, 330 feet south and 300 feet west of NE cor. W half of NE of Section 18, Block 19, was dry and abandoned at 2,528 feet. Roberts Oil Corp.'s No. [illegible] Grayson, 2,083 feet north and 330 feet west of SE cor. of their lease out of Section 13, Block 19, T.&P.R.R. Survey, was dry and abandoned at 2,516 feet.

Pecos County

Littman & Talbert's No. 1 Unsicker, Section 25, Block 10, H.&G.N.R.R. Survey, was dry and abandoned at 1,51[illegible] feet. Marland & McMan Oil & Gas Co.'s No. 13 Yates was completed January 7, 1928, at 1,315-1,450 feet, made 50 bbls. hourly and was drilled deeper to 1,45[illegible] feet and made 79 bbls. hourly, little water. It was then plugged back to 1,46[illegible] feet and is now making 70 bbls. hourly.

Winkler County

Humble Oil & Gas Co.'s No. 9 Hendricks-C, located 330 feet west and 1,320 feet south of NE cor. Section 10, Block B-12, had an initial production of 21[illegible] bbls. hourly at 2,882-2,912 feet. Its No. 5-C Hendricks, located 2,150 feet from the south and 2,310 feet from the west lines of Section 10, Block B-12, topped the lime at 2,620 feet, was drilled to a total depth of 3,638 feet, plugged back to 3,032 feet, made 300 bbls. water and was dry and abandoned. Southern Crude Oil Purchasing Co.'s No. 31 Hendricks T-88-M, 1,980 feet south and 1,650 feet from east line of Section 33, Block 26, topped the pay at 2,761 feet, was drilled to a total depth of 2,825 feet and had an initial production of 105 bbls. hourly. Its No. 3 Hendricks T-89-J, located 2,20[illegible] feet south and 330 feet east of Section 9, Block B-12, had an initial production of 3,000 bbls. daily at 2,730-2,928 feet. Texon Oil & Land Co.'s No. 6 Hendricks-B, 1,650 feet south and 990 feet west of Section 45, Block 26, had an initial production of 10,000 bbls. daily at 2,77[illegible] 2,823 feet and 14 per cent water. Independent Oil & Gas Co.'s No. 3 Hendricks-B made 300 bbls. daily at 2,855-2,90[illegible] feet.

South of Big Lake

Two and one-half miles south and 1½ miles west of the Skelly Pool, south of Big Lake in Reagan County, the California Co.'s No. 5 University, SW cor. NE Section 16, Block 7, University Land, picked up a showing of oil at 2,957 feet and created considerable interest in that area. The well topped pay at 2,957 feet and at 2,986 feet it made one bailer of sulphur water along with 10 gallons of oil per hour. The oil tested 26 gravity corrected. At 2,960 feet it had approximately 800 feet of fluid in the hole showing a small amount of water after standing for five days. It is now coring ahead at 3,005 feet.

Texon Oil & Land Co.'s deep well in the Big Lake Pool made another production peak when the Monday morning gauge showed it to have put 2,255 bbls. in the tanks during the 24-hour period. The gas flow during the same period gauged 21,770,000 feet. The well made 2,212 bbls. the day before.

Ward County Drilling

Gulf Production Co.'s No. 4 O'Brien, CWL Section 19, Block F, Ward County, just north of Wickett, topped salt at 1,290 feet. It is drilling ahead in potash and salt at 1,750 feet. Surface elevation of the well is 2,657 feet making the salt top 1,367 feet plus.

This makes the well 312 feet higher on the salt than the discovery well in the O'Brien Pool, 9 miles to the northwest of No. 4 O'Brien. Five miles east of the Gulf company's wildcat Marland and Zoch's No. 1-A Sealy, Section 78, Block A, found the salt 353 feet lower than it was found in No. 4 O'Brien.

In the Shipley area of Ward County J. H. L. Oil Co. deepened its No.

Hayzlett, Section 17, Block 5, 1 foot to 2,470 feet without getting an increase in production. It is scheduled to be drilled deeper. It is making a little better than 55 bbls. daily on the swab. A steel line measurement of the discovery well in the Shipley area shows it to have a total depth of 2,473 feet instead of 2,481 feet. The well is making around 100 bbls. daily.

Production of West Texas declined 3,040 bbls. last week to 382,600 bbls. due to declines in Howard County pools. Winkler County showed a small increase and the production of other counties fluctuated but little.

DAILY AVERAGE PRODUCTION BY LEASES
WINKLER COUNTY
Week ending March 19
HENDRICKS POOL

Company, farm, sec., blk.—	Wells	Prod.
Amerada Pet. Corp.:		
Cowden, 3, B-12	3	1,091
Atlantic O. P. Co.:		
Hendricks-A, 34, B-5	8	1,337
Hendricks-B, 44, 26	4	599
Hendricks-D, 29, B-5	8	3,061
Hendricks-E, 41, B-5	6	3,474
Hendricks-G, 46, 26	7	1,359
Hendricks-H, 30, B-5	1	44
Atlantic and Collett:		
Hendricks-F, 40, 26	13	1,705
Bankers Prod. Co.:		
Hendricks, 39, B-5	1	.....
California Co.:		
Hendricks, 29, B-5	8	1,287
Cranfill & Reynolds:		
Hendricks-A, 28, B-5	2	181
Hendricks-B, 35, B-5	1	101
Hendricks-C, 33, 26	2	147
Hendricks-D, 33, 26	1	.....
Hendricks-E, 33, 26	2	634
Cranfill and Texon:		
Hutchings, 47, 26	1	83
Culberson Brothers:		
Hendricks, 40, B-5	1	88
Eastland Oil Co.:		
Hendricks, 35, B-5	2	458
Hendricks-B, 35, B-5	1	243
Gulf Prod. Co.:		
Hendricks-A, 34, B-5	13	4,867
Hendricks-B, 45, 26	11	7,537
Hendricks-C, 40, B-5	6	2,279
Hendricks, 44, 26	2	832
Cowden, 3, B-12	2	1,421
Humble Oil & Ref. Co.:		
Hendricks-A, 34, B-5	17	5,991
Hendricks-B, 29, B-5	6	1,406
Hendricks-C, 32, 26	8	828
Hendricks-B, 47, 26	7	1,281
Hendricks-C, 10, B-12	6	3,213
Independent O. & G.:		
Hendricks-A, 34, B-5	8	1,421
Howe-B, 44, 26	3	136
McCabe, 36, B-5	2	336
Hendricks, 42, B-5	1	17
Vardeman-B, 41, B-5	6	1,050
Magnolia Pet. Co.:		
Hendricks, 29, B-5	8	854
Marland Oil Co.:		
Hendricks, 33, 26	4	1,163
Hendricks-A, 29, 26	2	214
Hendricks-B, 34, 26	2	331
May Prod. Co.:		
Hendricks, 34, 26	1	.....
American Maracaibo:		
Hendricks-A, 28, B-5	1	86
Hendricks-B, 28, B-5	1	205
Mining & Eng. Co.:		
Hendricks, 10, B-22	1	105
Murchison & Cranfill:		
Hendricks-A, 35, B-5	3	1,312
Hendricks-B, 35, B-5	3	484
Hendricks-C, 35, B-5	1	37
Hendricks-H, 33, 26	1	1,816
Hendricks-I, 47, 26	2	523
Prairie Oil & Gas Co.:		
Hendricks, 40, 26	6	1,209
Cowden, 3, B-12	6	4,448
Pure Oil Co.:		
Hendricks-A, 41, B-5	11	2,216
Hendricks-B, 34, B-5	13	4,927
Hendricks-C, 45, 26	14	9,461
Hendricks-C, 44, 26	1	227
Republic Prod. Co.:		
Hendricks-A, 45, 26	6	2,199
Hendricks-B, 41, B-5	5	1,800
Hendricks-C, 42, B-5	5	355
Shell Pet. Co.:		
Hendricks-A, 45, 26	6	1,780
Hendricks-B, 29, B-5	5	1,344
Hendricks-C, 29, B-5	8	2,508
Hendricks-D, 41, B-5	6	694
Hendricks-E, 49, B-5	3	919
Hendricks-F, 46, 26	8	2,222
Hendricks-G, 39, 26	1	80
Shell-Texas Co.:		
Cowden-A, 3, B-12	6	1,545
Hendricks, 45, 26	6	1,783
Hendricks-A, 29, B-5	11	5,763
Hendricks-B, 40, 26	6	805
Hendricks-C, 40, 26	6	2,370
Hendricks-D, 40, 26	6	879
Hendricks-E, 39, 26	6	691
Skelly Oil Co.:		
Hendricks, 40, 26	12	8,638
Hendricks-B, 39, 26	2	40
Hendricks-C, 39, 26	1	645
Southern C. O. P. Co.:		
T-67 Hendricks-A, 42, B-5	3	182
T-67 Hendricks-3-A, 4, B-12	4	352
T-67 Hendricks-B, 44, 26	5	727
T-67 Hendricks-3-B, 33, 26	5	643
T-67 Hendricks-C, 33, B-5	5	765
T-67 Hendricks-2-D, 28, 26	4	845
T-67 Hendricks-E, 42, B-5	4	135
T-67 Hendricks-F, 33, B-5	4	1,050
T-68 Hendricks-3-A, 35, B-5	3	272
T-68 Hendricks-B, 46, 26	2	196
T-88, Hendricks-A, 44, 26	6	1,057
T-88 Hendricks-B, 4, B-12	4	1,182
T-88 Hendricks-C, 29, B-5	7	891
T-88 Hendricks-D, 4, B-12	5	2,876
T-88 Hendricks-H, 28, B-5	6	1,164
T-88 Hendricks-I, 30, B-5	7	2,241
T-88 Hendricks-J, 30, B-5	5	2,141
T-88 Hendricks-K, 41, 26	5	1,530
T-88 Hendricks-L, 4, B-12	5	959
T-88 Hendricks-M, 33, 26	30	14,478
T-88 Hendricks-N, 28, 26	5	1,245
T-88 Hendricks-O, 28, 26	2	433
T-88 Hendricks-P, 28, 26	1	245
T-88 Hendricks-Q, 27, 26	1	377
T-88 Hendricks-R, 27, 26	3	1,037
T-88 Hendricks-S, 34, 26	4	1,203
T-88 Hendricks-T, 34, 26	6	768
T-88 Hendricks-U, 41, 26	7	1,362
T-88 Hendricks-V, 29, 26	1	77
T-88 Hendricks-W, 5, B-12	1	367
T-89 Hendricks-A, 35, B-5	3	154
T-89 Hendricks-B, 35, B-5	2	582
T-89 Hendricks-C, 35, B-5	3	625
T-89 Hendricks-D, 35, B-5	1	336
T-89 Hendricks-E, 40, B-5	2	164
T-89 Hendricks-F, 40, B-5	1	104
T-89 Hendricks-H, 46, 26	1	48
T-89 Hendricks-I, 10, B-12	2	882
T-89 Hendricks-J, 9, B-12	2	1,265
T-264 Hendricks, 5, B-12	1	off
T-90 Hutchings, 47, 26	1	113
Texon Oil & Land:		
Hendricks-A, 41, B-5	6	694
Hendricks-B, 45, B-5	5	1,044
Winkler O. P. Co.:		
Hendricks, 33, 26	1	99
Grand total Hendricks Pool	546	162,105

Leck Area

Atlantic-Kessler & Logan:		
Leck, 3, 74	2	536
Amerada Pet. Corp.:		
Leck, 3, 74	2	757
Empire G. & F. Co.:		
Daugherty, 3, 74	3	579
Magnolia Pet. Corp.:		
Scarborough, 1, C-22	1	153
Gulf Prod. Co.:		
Scarborough, 1, C-22	1	49
Shell and Llano Oil:		
Scarborough, 1, C-22	3	163
Shell and Danciger:		
Leck, 3, 74	2	483
Prairie O. & G. Co.:		
Daugherty, 3, 74	1	414
Warner-Quinlan:		
Leck, 3, 74	1	488
Total Leck Pool	16	3,622

O'Brien Pool

Marland Oil Co.:		
Morton, 10, B-12	2	345
Wentz Oil Corp.:		
Morton, 10, B-12	1	312
Simms Oil Co.:		
Sealey, 50, F	1	174
Richardson et al:		
Stockton, 50, F	1	.....
Total O'Brien Pool	5	831
Grand total Winkler County	567	166,558

PECOS COUNTY
YATES POOL
Week ending March 19

Company, lease—	Wells	Prodn.
California Co.:		
Yates—Lease 1	18	6,851
Smith—Lease 1, Sec. 27	3	477
Smith—Lease 1, Sec. 23	6	1,510
Smith—Lease 1, Sec. 21	3	956
Smith—Lease 2	2	175
Smith—Lease 3	12	1,770
Tippett—Lease 1	1	39
Cosby Drlg. Co.:		
Smith	1	.....
Gulf Prod. Co.:		
All leases	32	11,125
Humble O. & R. Co.:		
Smith	10	1,469
Smith-B	5	785
Kirby Pet. Co.:		
Tippett	2	60
Kirby Pet. and Edson:		
Tippett	1	210
Marland Oil Co.:		
Yates-A	6	1,354
Yates-A-S	3	96
Matador Oil Co.:		
Smith	2	992
Mazda & Savoy:		
Smith	3	659
McMan O. & G. Co.:		
Smith-A	1	1,162
Smith-B	4	982
Smith-C	4	832
Tippett	2	268
Richardson	1	71
McMan and Marland:		
Yates	17	3,726
Mid-Kans. and Transcontinental:		
Yates-A	24	11,932
Yates-B	27	5,643
Yates-C	11	5,737
Yates-D	6	6,319
Yates-E	1	92
Yates-F	4	652
Yates-G	4	986
Yates-H	8	5,579
Smith	3	1,136
Smith	18	2,687
A. W. Hawse:		
Pecos River Bed	7	750
Pecos Valley Oil Co.:		
Fee, Sec. 22, Blk. 26	2	116
Phillips Pet. Co.:		
Smith	1	68
Red Bank Oil Co.:		
Smith	5	552
Shell Pet. Co.:		
Tippett	11	2,123
Smith	9	882
Smith-B	1	633
Smith-D	3	549
Smith-E	1	15
Simms Oil Co.:		
Smith	7	5,012
Skelly Oil Co.:		
Tippett	1	90
Grand total Yates Field	293	87,122

PRICES IN U. S. MOTOR GASOLINE ADVANCE

(Continued from Page 32)

at least who feel that an advance at this time—especially the export grades—would be premature.

A substantial movement of these high gravity grades will be necessary next month from Oklahoma and North Texas refineries if the advances in the domestic market are maintained.

Export buying has been light since late in January when spot purchases were made and contracts sold for delivery over a period of several weeks. Some of these contracts expire the first of the month. Most observers feel that due to the high gasoline production rate this export movement is more essential this year than last and stable condition cannot be maintained unless export purchases are made from inland refineries from time to time. Some definite action is expected within the next 10 days or two weeks.

Kerosene Prices Higher

The one-half-cent advance in kerosene has placed prices for that product at the high of last year. Early last September the fall demand for kerosene advanced the price of 41-43 water white kerosene to 6½ cents the prevailing quotation for the same grade the first of the week. At that time, however, U. S. Motor gasoline was selling for 9¾ cents.

It is agreed within the trade that present kerosene prices are out of line with prices prevailing on other refined products. So far as the Mid-Continent is concerned, however, a real shortage has developed and it probably will require a month or six weeks to remedy the situation with increased output. As was explained in these columns several weeks ago the strong kerosene situation is due to a combination of a heavy furnace oil demand and reduced yields from some of the new crude oil supplies with a satisfactory export movement.

With the kerosenes now selling on a parity with the domestic grades of naphtha and gasoline there is disparity in the values which cannot be supported indefinitely. With the furnace oil demand practically over for many refiners there will be an increase in supply coming from both the distillate and naphtha cuts of the refinery operation.

Kerosene buying was active both in the domestic and export market during the week. The Sinclair Refining Co. is reported to have purchased over a million gallons from North Texas refiners and jobber purchases were exceptionally large. Many of the buyers are anxious to cover their requirements over April when the actual demand from the consumers of the Middle West will be active.

Gasolines and Naphtha

Although the advance to 7⅛ cents for U. S. Motor gasoline was announced last week by several companies a few days would be required to establish the market on that basis. Refiners in their reports on Monday showed considerable material still moving at 7 cents.

The jobber demand has improved with better weather conditions. New business was especially active the first of the week. The 60-62 400 endpoint grade was available as low as 7½ cents and the 64-66 375 grade was selling at 7¾ cents to 8¼ cents.

Blend prices due to the high natural gasoline market have advanced sharply. No changes were reported in naphtha prices.

Kerosene and Distillates

The kerosene situation has been previously explained. With the 41-43 grade at 6½ cents the few refiners making the high gravity grades advanced their price to 7 cents for the 42-44 water white grade. This was higher than the prevailing quotation for the 50-52 450 naphtha and as much as some refiners were getting for U. S. Motor gasoline.

Distillates prices due to the advance in kerosene were firm although the demand is decreasing weekly with the end of the consuming season at hand. Less is heard of the low cold test requirement and prices on all grades are more uniform.

Fuel Oils and Gas Oils

Fuel oil prices are steady. One large buyer was unable to interest Oklahoma refiners in a large purchase of fuel oil under 22 gravity at present prices for shipment next month. Gas oils are easier but prices have not changed.

Lubricants and Wax

At least one large refiner advanced cylinder stocks during the past week. The better grades are in strong demand from eastern buyers due to the advance in Pennsylvania material. Bright stocks also are in demand and prices steady.

The spot market on wax is inactive. Export buyers have made inquiries for large quantities at 3¼ to 3½ cents per pound. A little business was placed at the latter figure but most sellers are asking higher prices.

"PROMETHEUS" PRESENTS ENGAGING STORY OF OIL

Writing in the same jovial vein that characterized his "Aladdin, U. S. A.," Ernest Greenwood has presented an engaging history of fire and heat in his latest book, "Prometheus, U. S. A." published by Harper & Brothers, New York. The 214-page volume traces the story of fire and heat from legendary days, describes entertainingly the early uses of wood as fuel, narrates the important part coal has played in civilization's advancement, discusses the immense gas industry and then launches into a fascinating story of petroleum. Automatic heat, as it is provided by the modern oil burner or the modern gas heater, is the subject of a delightful chapter entitled "The Perfect Servant."

Mr. Greenwood has a bit of good-natured fun at the expense of those who see the end of the world's oil and gas resources just a few years away. He relates the anecdote concerning John D. Archbold, later president of the Standard Oil Co., who upon hearing a suggestion that oil might be found in Oklahoma and Texas, said: "Hell, I'll drink all the oil they ever find in Oklahoma or Texas."

After asserting that there is every evidence that our oil supply is assured for hundreds of years the author says: "This does not mean that wastefulness either in method of production, refining or utilization is in any way excusable; it does mean, however, that we need have little or no hesitancy in developing new uses for petroleum and its products and stop worrying about the pessimistic forebodings of statisticians."

GULF COAST MARKET FUEL AND LUBS FIRM

HOUSTON, Tex., Mar. 26.—A strong fuel oil situation with a firm tone to lubricating oils characterized the Gulf Coast refinery market at the opening of the week. Fuel oils continued scarce with prices unchanged at a minimum of 72½ cents a barrel in cargo lots. Lubricating oils found a steady movement. In line with the customary March increase in demand a slight trend towards the heavier viscosity oils was evident. As warmer weather approached in the consuming territory prices on all grades were steady but it was not probable that the increased demand is sufficient to justify advances in the immediate future. Gas oils were unchanged.

E. G. M'CLURE DIES

WASHINGTON, Pa., Mar. 23.—E. G. McClure, aged 78 years, long a resident of Washington, died in his home at Charleston, W. Va., after a lingering illness. He began work in an oil well machine shop at Titusville, Pa., and later was in business for himself at Bradford, subsequently moving to Cherry Grove, Pa., and then to Washington, taking J. J. Davin as a partner. Later he bought the shops of Zahniser Brothers and Sten at Burgettstown, afterwards moving to Charleston, W. Va., where he continued in business until 1923.

RECORD ATTENDANCE AT A.A.P.G. MEETING

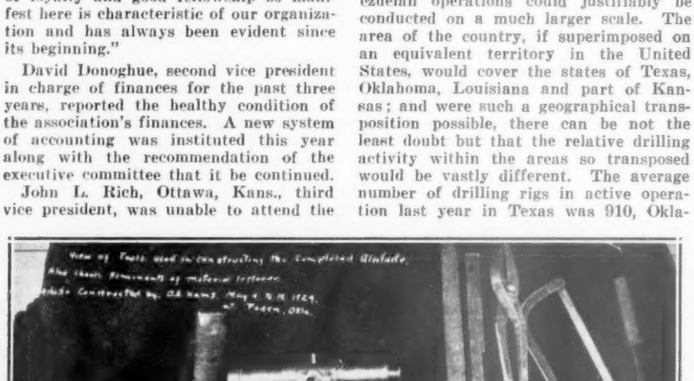
(Continued from Page 34)

of the profession who are eligible for membership. At the present time the association has more than 2,100 active members in 41 states and 30 foreign nations. Last year 174 new members were added to the rolls and 170 geologists have their applications on file.

In recognition of the keen interest in the meeting and the attendance he said, "this splendid attendance is representative of the loyal and whole hearted support that our members give to their profession and this association. The spirit of loyalty and good fellowship so manifest here is characteristic of our organization and has always been evident since its beginning."

David Donoghue, second vice president in charge of finances for the past three years, reported the healthy condition of the association's finances. A new system of accounting was instituted this year along with the recommendation of the executive committee that it be continued.

John L. Rich, Ottawa, Kans., third vice president, was unable to attend the convention due to illness. The report of the bulletin editor was read by G. C. Gester, of San Francisco, who lauded the work carried on for the past three years.



Homemade alidade and tools used in making it.

Before the time set for formal opening of the convention the ballroom where the main program was held was crowded to capacity. R. A. Liddle, chairman of the program committee, opened the meeting with an address of welcome. Amon G. Carter, Fort Worth publisher, made the welcoming address on the behalf of Fort Worth. Mr. Carter himself is interested in the oil business to the extent of a flock of dry holes numbering somewhere around two score and said he felt perfectly at home among such a gathering. He described his wildcat work to date as work carried on that yielded nothing to him except a lot of information and he is of the belief that the geologist is a nervous person who draws more crooked lines and gets less oil than any one in the industry.

Permian Basin Main Topic

The Permian Basin of the Southwestern United States was the general topic of the meeting with most of the papers and discussions dealing directly or indirectly with that subject. The Paleontologists and Mineralogists held their sessions in a separate room.

Some of the papers deal with the economics of the industry and first among these was a paper on developments in Michigan in 1928 by Theron Wasson, Pure Oil Co., Chicago. Mr. Wasson dealt at length with the structural conditions in Michigan and reviewed the developments during the year. In conclusion he stated he did not believe Michigan would be a serious threat to the general crude market although 8,000 bbls. of production is shut in at this time in Michigan.

Venezuela's Position

H. J. Wasson, New York, read a paper on "Some Geologic and Economic Notes on the Venezuelan Oil Developments." E. B. Hopkins, New York, aided in the construction of this report.

Mr. Wasson declared the combination of Venezuela, West Texas and the Gulf Coast with periodic pressure from California, will probably force a large volume of high-price Mid-Continent oil out of the Atlantic States market. Venezuela's rapid rise is in no way related to boom development as known in the United States. Its rise to a production of 106,000,000 bbls. annually has been steady but not the result of any great accelerated drilling campaign. When thoughtfully considered, he said, there is little ground for criticism of operators in the South American country.

Going further into the question he said: "From the standpoint of known resources and prospective oil reserves, Venezuelan operations could justifiably be conducted on a much larger scale. The area of the country, if superimposed on an equivalent territory in the United States, would cover the states of Texas, Oklahoma, Louisiana and part of Kansas; and were such a geographical transposition possible, there can be not the least doubt but that the relative drilling activity within the areas so transposed would be vastly different. The average number of drilling rigs in active operation last year in Texas was 910, Oklahoma 715, California 511 and Venezula 85.

Mr. Wasson does not believe that a tariff would stay the spread of Venezuela crude oil. A summary of his paper follows:

Because of favorable geographic position and low production costs, it is inevitable that Venezuela ultimately will obtain a very large share of the Atlantic States business.

Venezuela's fairly rapid growth may be expected to continue until it reaches about 600,000 bbls. daily in 1932. Beyond this point market resistance will probably hold expansion in check.

It is believed that neither tariffs nor any other artificial obstacle can stay the spread of Venezuelan oil into markets it can supply most cheaply.

The result should be to hasten the rationalization of Mid-Continent production to dimensions consistent with consumption within its own logical market zone. This market, after all, is one of splendid proportions, and sufficient, if properly handled, to yield a satisfactory profit to all concerned.

Before the close of the morning session on the last day the resolutions committee headed by W. E. Wrather prepared resolutions thanking the Fort Worth society and the committees who co-operated in making the convention such a success. Another resolution thanked Dr. Charles P. Berkey, University of Columbia, for his lecture delivered to the public on his work in the Gobi Desert.

International Convention

The association voted to join with other scientific organizations in requesting the national government to extend a formal invitation to the International Geological Congress to hold its sixteenth meeting in the United States. That meeting will be held in 1932. Petroleum has been suggested as the congress topic in 1932.

This year the congress will meet in South Africa and the general topic will be gold. The 1926 meeting was held in Madrid, Spain, and phosphates and pyrites formed the topic.

As the meeting was being brought to a close the new officers met with the retiring officers and familiarized themselves with the routine work of the association and took over their duties.

The entertainment features of the convention were numerous, but the crowning event was the barbecue and rodeo Friday night. The barbecue was given in the automobile building at the Fat Stock Show grounds and the rodeo in the Coliseum. Both were attended by capacity crowds. Numerous lunches were held and many dances given and golf tournaments were held for both men and women.

Two field trips were made after the convention. One party left Saturday afternoon and another started Sunday. Both returned to Fort Worth Sunday night in time to catch night trains.

Home Made Alidade

The most interesting exhibition yet made at an American Association of Petroleum Geologists meeting, was shown at the convention. B. E. Thompson, chairman of the committee of arrangements, started early in allocating space and all the space was taken long before the opening day. One display attracting special notice was an alidade made by Oscar E. Hans, Fort Worth, consulting geologist. The instrument was made in 1924 and required 10 days' time. At that time Mr. Hans was in Paden, Okla. Being without connections at that time and in need of the instrument he decided to construct one. The total cash outlay amounted to 45 cents. He had an old telescope that could be used, tools and a place to do his work. The parts he used were found in scrap yards. The instrument was used for six months with efficient results.

At the close of the meeting it was shipped to Lincoln, Neb., where it will remain at the university from which he graduated. It is enclosed in a glass case formerly used as a standard pen and pencil display. In the case are all of the tools used in making the instrument.

The parts he used in making the alidade consist of a Ford brass air pump; one one-half-inch brass tube 7 inches long and one 1½-inch by 18-inch heavy brass tube, both of which cost 45 cents; one brass liner of a water pump cylinder and one one-sixteenth-inch 8 by 20 brass sheet (an old door buffer).

The tangent screw was made from parts of a gas meter; screws made from small brass rods and dry cell battery screws were used. Other parts consisted of valve stems from an inner tube, brass framework of a clock. The jewel for compass needle was made from a piece of a bottle and bearings for the main axis were cast from babbitt metal. Cross hairs were made of silkworm web and the cross hair ring suspended by four capstan screws. Stadia arc was engraved by means of a specially homemade mechanism, hand engraving being impractical. The lenses came from a small spy glass. All of the work was done in a living room and on a back porch.

PANHANDLE FIELDS

(Continued from Page 43)

plugged back to 3,360 feet, shot with 60 quarts at 3,340-60 feet and had an initial production of 1,417,000 feet of gas.

Eastland County

Panhandle Oil & Refining Co.'s No. 2 Wheeler was dry and abandoned at 1,200 feet.

Stephens County

Lone Star Gas Co.'s No. 1 Lyles made 40 bbls. after having a 20-quart shot at 3,660-80 feet and drilled to a total depth of 4,090 feet. Phillips Petroleum Corp.'s No. 1 Stuart was dry and abandoned at 2,285 feet.

Shackelford County

Big State Oil Co.'s No. 7 Russ-Webb was dry and abandoned at 1,260 feet. Engle Brothers' No. 1 Matthews-B made 330 bbls. at 1,127-40 feet. Mid-West Exploration Co.'s No. 4 Dyer made 110 bbls. at 822-835 feet. Terry and others' No. 1 Moberly was temporarily abandoned. Wichita Production Co.'s No. 7 Myer made 2 bbls. at 988-90 feet. Young Brothers & Alexander's No. 1 Matthews was dry and abandoned at 1,160 feet.

PANHANDLE COMPLETIONS
Week Ended March 23
Carson County

Reynolds and others' No. 1 E. Cooper was drilled to a total depth of 3,187 feet, plugged back to 3,167 feet, shot with 120 quarts at 3,102-57 feet and made 120 bbls. This well is 330 feet from south line and 330 feet from east line NW Section 5, Block 9, I.&G.N.R.R. Survey.

Gray County

Gardner Brothers & Collins' No. 1 Saunders, in J. G. Eustis Survey, was drilled to a total depth of 2,533 feet, shot with 30 quarts at 2,510-25 feet and flowed 187 bbls. Republic Production Co.'s No. 1 Saunders, located 330 feet each way from SW cor. E half NW cor. Section 4, Block 1, A.C.H.&B. Survey, made 40 bbls. at 2,710-85 feet and was drilled to a total depth of 2,833 feet. Shamrock Oil Co.'s No. 2 Clayton made 1,070 bbls. at 2,812-24 feet, 43 degrees gravity oil and 3,000,000 feet of gas. The Texas Corp.'s No. 1 Williams made 525 bbls. at the granite wash encountered at 2,664-75 feet. Howell Oil Corp.'s No. 1 Furneaux was temporarily abandoned at 2,254 feet. Marland Production Co.'s No. 1 Finley Brown made 1,055 bbls. at the granite wash found at 2,843-45 feet, 42.4 degrees gravity oil. Operators Oil Co.'s No. 3 Jackson made 3,500 bbls. of 41 degrees gravity oil at the granite wash found at 2,840-45 feet and 10,000,000 feet of gas.

Hutchinson County

Phillips Petroleum Corp.'s No. 1 Sanford was drilled to a total depth of 3,030 feet, plugged back to 2,902 feet, shot with 170 quarts at 2,837-98 feet and made 10 bbls. oil and 10 bbls. water. The Texas Company's No. 3 Garner was drilled to a total depth of 3,190 feet, plugged back to 2,960 feet and made 10,000,000 feet of gas at 2,860-80 feet.

Wheeler County

Edwards and others' No. 2 Trostle, located C NW NW Section 130, Block 23, H.&G.N.R.R. Survey, made 45,000,000 feet of gas at 1,800-60 feet.

TEXAS COMMISSION TO CUT HOWARD PRODUCTION

(Continued from Page 38)

this break is continuous throughout the field.

"9. The records suggest that the pay members vary in thickness, porosity, and permeability. Due to the changing conditions and irregularities in the saturation of the pay formation, possibly the best production occurs in a part of the zone of relatively small or no great thickness. In which case, due to the more or less open character of this part of the formation, the drainage is considerably more rapid than in the tighter formation; consequently, as soon as this part of the pay is partially or completely depleted it forms a more or less natural channel for water encroachment.

"10. The water first reaches the well through the more porous and permeable parts of the pay, which may or may not occur at regular interval in the pay zone.

"11. Rapid removal of the oil is favorable to and encourages premature flooding in the more porous and permeable parts of the lime, thus trapping and complicating recovery in the saturated but tighter parts of the formation in the pay zone.

Gradual Rise Desirable

"12. A gradual rise of the water table, more nearly in accordance with structure contours, suggesting a somewhat regular displacement of oil with water, is desirable for obtaining the highest possible ultimate recovery because it indicates complete flooding of the pay zone. Theoretically at least the water should fill the voids completely and gradually reach the highest point on the structure, as the oil is withdrawn from the reservoir.

"13. When channeling and by-passing occur, especially in the lime formations, through the more permeable parts of the pay and the water reaches the well,

it is not possible, in many cases, by pumping methods, after a period of time, to lower the fluid level of the water sufficiently to recover the oil occurring in the tighter areas.

"14. Studied control of water conditions, methods, and uniform practices for taking advantage of the natural water drive should be recommended. Maintenance of a high fluid level, together with slow and continuous pumping practices in wells producing clean oil ahead of the encroaching water, will probably retard the water encroachment into the well and will result in a better recovery.

"15. It is the common practice to pump continuously and handle the maximum amount of fluid possible by increasing the rate and length of stroke in the wells making considerable water. The purpose of this practice, which is often questioned, is largely to increase or hold the daily production and at the same time protect offset wells better located on structure.

Higher Ultimate Recovery Possible

"16. Quite often a lease or well is judged, particularly in a lime pay, by the daily production which is obtained by forced methods favorable to water encroachment under competitive conditions; whereas, a higher ultimate recovery can be obtained through more conservative production methods.

"17. Holding back pressure in the lime fields at the casinghead or by the fluid level method favors a more or less gradual oil production desirable in conserving and maintaining uniform well pressures, and preventing premature and abnormal water conditions detrimental to the maximum recovery.

"18. The safe penetration depth depends primarily upon the location of the well and date of completion. The conditions in the pay reservoir are continually changing. In the Roberts-Settles Pool, by the end of the first six months, the lower part of the 3,000-foot pay zone in the west half of the field, where development work first started, was badly flooded. Where an impervious formation separates the pay into one or more parts, it becomes necessary to drill through and at least 'top' the lowest pay member in order to obtain the oil. These best pay streaks, which are the most porous and permeable parts of the pay zone, later constitute natural channels for encroaching water. The incoming water may enter the hole at the top, middle, or bottom of the pay section, making it difficult or impossible to outline systematic repair work, especially where encroaching waters in lime pay are concerned. Each well must be studied individually and the remedial work, if advisable, planned accordingly.

One Well to 42 Acres

"19. The proven area consists of approximately 2,500 acres, on which 60 producing wells have been drilled (March, 1929) to the 3,000-foot pay. These figures give an average of one well to each 42 acres. A conservative and liberal spacing of wells has prevailed in developing the 3,000-foot pay. Possibly a better grouping of wells could have been obtained and more uniform drainage area set up with one well to each 40 acres, or 660 feet from property lines.

"20. In making this study only the 3,000-foot pay has been considered in detail. There are three important pay horizons above this pay, viz., 1,300, 1,800, and 2,500-foot pays. The 1,300 and 1,800-foot production comes from sand formation, while the 2,500-foot production occurs in a porous limestone. The formations below the 3,000-foot pay have not been tested in a well by deep drilling favorably located on structure.

"21. Early in the life of the field it became necessary to treat the oil. Two methods are in common use; viz., (1) electric dehydrator, and (2) 'hay tank.' During the cold weather it was necessary to add treating compound and also heat the emulsion in both methods to obtain a complete separation of oil and water, and prepare the oil for shipment.

"22. It has been the feeling in the past that it was not possible under pumping conditions to remove the oil from a well fast enough to pull in the water thus causing premature flooding. Possibly in sand production this in general is true, however, in lime production with a natural high fluid level and where the movement of fluid towards the hole is more rapid due to the higher porosity and permeability, it is believed that the daily production can be forced by pumping methods to such a point as to be detrimental to the maximum recovery.

Statement Substantiated

"This statement is substantiated by the fact that water has appeared in several wells at the time or shortly after swabbing (which practice has been discontinued) or following production tests when more or less forced production methods were used to obtain the maximum daily potential for proration purposes. A specific example is noted in which a well producing through 4-inch tubing made considerable water, but upon changing to 3-inch tubing and maintaining a high fluid level the well produced clean oil. Individual water production records are not available for analysis, and comparison of various production methods under different conditions are not possible.

"23. Possible sources of water:

(a) Casing leak and casing seats.

(b) Fault, broken formation, or crevice from below pay.

(c) Edge water.

"(a) The importance of systematic casing and the exclusion of top and intermediate water from the producing zone by cementing methods has long been appreciated. Casing and collar leaks occur in many ways, often through bad fishing jobs or intensive bailing and swabbing operations. Channeling of cement and poor casing seats sometimes are responsible for the water conditions in a well. These sources generally can be located before damage is done if proper precautions are taken. The best and safest practices favor bailing the hole dry and testing the casing for leaks before drilling out the cement plug, and again testing after the plug is drilled and before the pay formation is encountered. These operations are simple and positive in determining the condition of the hole before drilling into the pay, which information is of considerable value when water or other troubles occur.

Waters Especially Corrosive

"The waters associated with the oil in the lime fields are especially corrosive, and their effect in some cases upon casing, tubing, pumping equipment is very rapid and detrimental. The highly corrosive action of these waters favors the use of sufficient quantities of cement behind the pipe to obtain a proper shut off, and also to protect the pipe in the water zones against circulating waters.

"(b) A number of cross sections were drawn through the pool from carefully compiled well records and correlations were made accordingly at the top of the pay. The top of the lime pay in the various wells, as selected from the cross section work, suggested a generally regular structure. In other words, the holes as a rule were fairly straight or relatively crooked.

"There is no definite information to indicate that water is migrating from a deeper seated formation along a fault plane.

"(c) The pay section was divided into two parts, and the wells classified accordingly to their penetration; i.e., the wells with a relatively small penetration were considered in one group, while the wells drilled through or to the lower part of the pay section were placed in a second group. The dates on which water appeared in the two groups of wells were noted and the interpretation showing the progress of the edge water encroachment made as shown on the drawings. This interpretation indicates that the principal source is a natural water encroachment inward from the edge of the field, following the oil production.

Practices Recommended

"24. During the course of this study on water encroachment and preventive measures, several practices have been recommended and suggested, namely:

1. Swabbing of wells for test be discontinued.

Observation has convinced this committee that in individual cases swabbing has been detrimental. Furthermore, the swabbing method of obtaining potential production or well capacity is not a correct basis of comparing production, since pumping is the regular method of producing wells.

"We recommend as a substitute for the swabbing method, that the tests be made by pumping each well one hour each calendar month and that the time of testing be set by the proration umpire in charge.

"2. Maximum diameter for well tubing be 3-inch inside diameter.

"3. No drilling be continued after cementing casing until a successful water shut off has been obtained.

"We recommend that the plug be drilled out and formation found in place, the hole bailed dry and allowed to stand for 12 hours, after which period the test be witnessed by the Railroad Commission deputy, or in his absence by an agent of the offset operator. In case of a disagreement between these two, the well will be shut down pending the return of the Railroad Commission deputy."

4. Back pressure be held by maintaining a high fluid column.

"25. In conclusion it is the opinion of the committee that a slow and gradual withdrawal of the oil will retard premature edge water encroachment and measures favoring this gradual withdrawal should be encouraged and continued."

The report is signed by the members of the committee: W. P. Laughter, Railroad Commission chairman; H. B. Hill, United States Bureau of Mines; H. C. Hardison, California Co.; W. W. Warner, Amerada Petroleum Corp.; A. L. Evans-Lombe, Superior Oil Co.

NINE NEW PRODUCERS IN MUSKEGON WITH INITIAL TOTAL OF 7,000 BBLS.

By Special Correspondent

MUSKEGON, Mich., Mar. 23.—Nine new oil producers with a combined initial flow of more than 7,000 bbls. a day and two dry holes were completed in the Muskegon Field during the past week. Six in Laketon Township are producers in the upper Traverse or Dundee. Three of the five in Muskegon Township are oil producers and two dry holes.

A record of initial production in the Dundee may be set by Nelson and Witt's No. 1 Horton well, NE SE, Section 11-10-17, which flowed 170 bbls. an hour for two hours at 2,051-55 feet. It will remain shut in as Nelson and Witt, Inc., have refused to sell at the present price of 60 cents per barrel. The well made this production with the tools in the hole and is estimated good for 200 bbls. an hour with the tools out. It has a flow of about 2,000,000 feet of gas.

The second largest producer was C. W. Marsh and others' No. 1 Albert Young, SE NE, Section 12-10-17, which came in at 2,028-30 feet with a flow of about 2,000,000 feet a day of gas and 1,500 to 2,000 bbls. of oil. The well filled 1,000 bbls. of field tankage in less than eight hours.

The Acme Oil Co.'s No. 1 John Dykstra, NW SE, Section 12-10-17, made 400 bbls. the first 12 hours from the Dundee at 2,032-39 feet.

Carl Damm's No. 1 fee came in at the rate of 1,500 bbls. from the Dundee pay sands at 2,054-57 feet, with about 2,000,000 feet of gas. It is NE SW, Section 12-10-17.

Nelson and Witt's No. 2 F. J. Gates, SW NE, Section 11-10-17, came in at 2,060-62 feet and will make a 450-bbl. initial producer in the Dundee.

The sixth new producer completed in the Dundee is the Manitou Oil Co.'s No. 1 Host, SE SE, Section 5-10-16, Muskegon Township, formerly known as Brown and Cornelius' No. 1 Host. It came in at 2,052-57 feet with a flow of about 2,000,000 feet of gas and from 50 to 100 bbls. of oil.

Three upper Traverse producers were brought in, one in Laketon Township and two in Muskegon Township. The Laketon Township well is the Johnson Oil Refining Co.'s No. 1 King, SE NW, Section 11-10-17, topped at 1,695 feet, which will make about 100 bbls.

The Swastika Oil & Gas Co.'s No. 1-B Gilbert, SW SE, Section 6-10-16, Muskegon Township, was an unexpected upper Traverse producer at 1,705 feet. It made 20 bbls. an hour to start but quit flowing for lack of gas. It will probably make 100 bbls. a day or more.

Cochran and Howard's No. 1 F. J. Durham, SE SW, Section 15-10-16, was shot to make a small producer in the upper Traverse at 1,708-56 feet. It may pump 20 bbls. a day.

The Continental Motors Corp.'s No. 11 fee, NE NW, Section 22-10-16, was ready to be abandoned and Boter Brothers' No. 1 Pappas, SE NW, Section 4-10-16, Muskegon Township, which struck oil, gas and water at 2,089 feet, will be plugged. The lease will be held for deeper drilling.

Two wells drilling in the upper Traverse in Muskegon Township appeared to have little chance for production at this depth. Continental Motors Corp.'s No. 9 fee, NW NW, Section 15-10-16, and L. R. Henley and others' No. 1 S. E. Bortz, NW SW, Section 7-10-16.

Drilling activity continues at about the same pace in spite of the poor market for Dundee oil. Daily shipments have increased to about 5,000 bbls. There were 27 wells drilling, 11 spudding or driving pipe, 13 rigging or moving in, 2 fishing, 66 undeveloped locations and 23 shut down.

Two new locations were made in Muskegon Township and seven in Laketon Township. The Muskegon locations are: United Gas & Oil Co.'s No. 2 J. D. Cooper, NE SW, Section 8-10-16; and Natural Gas & Oil Co.'s No. 3 Giles, NE NW, Section 7-10-16. Nelson and Witt, Inc., took out permits for five new locations in Laketon Township: Nos. 3, 4 and 5 F. J. Gates, SW NE, Section 11-10-17, No. 4 Horton, NE SE, Section 11-10-17, and No. 1 Clowar, NW NW, Section 13-10-17. The Holland Weideman Association's No. 2 Comley, NE NE, Section 14-10-17, and the Puritan-Majestic Oil Co.'s No. 2 Goudzwaark-DeLong, NE SE, Section 12-10-17, are the other two new locations.

The last has a rig erected, the only one on which operations have been started.

Association Names Directors

Eight members of the executive committee of the Michigan Oil and Gas Association who announced their resignations March 20 were re-elected this week. T. M. Simpson, president of the Greater Muskegon Chamber of Commerce and secretary of the Continental Motors Corp., which has completed 10 wells in Muskegon, was elected as the ninth member to fill the place never accepted by W. F. Weichers, of Saginaw, Mich., representative of the Pure Oil Co. Those re-elected are: E. J. Bouwsma, Charles H. Caswell and J. T. Norris; John G. Turner, E. C. Shields, Guy I. Warren, R. G. Bechtel and Oscar Davis. Election of new officers was postponed because of the death of Homer H. Johnson, president of the Johnson Oil Refining Co.

JOHN SMITH ADAMS DIES

CHATHAM, Ontario, Mar. 23.—John Smith Adams died recently at Sarnia, Ontario, in his eighty-third year, following an accident. As a young man he engaged in the oil business in Petrolia about 60 years ago, was for many years a driller and producer, and at one time owner of the Petrolia Topic. Later he was employed with Imperial Oil, Ltd., at Sarnia.

ENDORSEMENT ASSURED FOR CURTAILMENT PLAN

(Continued from Page 33)

dall Corporation, before and since his election as president of the American Petroleum Institute, has been most actively engaged in enlisting domestic petroleum executives in support of an effective policy in curtailing production, an essential preliminary to any program of world oil stabilization.

Requa Sees President

By Charles E. Kern

WASHINGTON, D. C., Mar. 26.—After the meeting of the board of directors of the American Petroleum Institute and Sir Henri Deterding, managing director of the Royal Dutch-Shell companies in New York tomorrow the board will draw up a statement of facts in respect to desired co-operation for conservation of world petroleum and forward it to the Federal Oil Conservation Board.

Mark L. Requa, of California, close friend of President Hoover for many years, has spent much time here and has had conferences with Mr. Hoover respecting world conservation plans so that when the board of directors of the Institute meet in New York tomorrow Mr. Requa will have full knowledge of the President's attitude toward world conservation.

It is not expected, however, that there will be any direct conference between the Institute and the President on this subject but they will approach him through the oil board. After the board has received the report Secretary Wilbur of the Department of the Interior and ex-officio chairman of the oil board may call for additional information or may request an open conference for the discussion of world conservation just as was done when national conservation was initiated. The procedure in that respect has not been determined.

Quite independent of this movement by the Institute is a proposal in an open letter received by the President and signed by Giford Pinchot, former Governor of Pennsylvania, acting for a committee to promote an inventory of the natural resources of the world, requesting the President to call an international conference for world conservation of natural resources.

PURPOSE TO AVOID WASTE, SAYS PRESIDENT TEAGLE

Pointing out that failure to secure the co-operation of oil producers in foreign countries would render ineffective the efforts of American operators to curtail crude overproduction, W. C. Teagle, president of Standard Oil Co. of New Jersey, states that crude oil is so easily transported that any oversupply in foreign countries has the same effect on the world situation as though obtained in the United States.

Referring to reports that efforts are being made to control not only the production of crude oil but also prices of products the world over, he says the sole purpose of the discussions which are taking place is to limit waste through uneconomic production. His statement follows:

"The meeting in New York of directors of American Petroleum Institute representing the producing interests in the United States, with the participation of Sir Henri Deterding of the Royal Dutch-Shell companies, has given rise to reports that efforts are being made to control not only the production of crude oil but prices of products as well the world over. Recent advance in gasoline in Great Britain has been cited as proof of the closeness of an agreement along these lines.

"It is common knowledge that what happened in the British markets was simply the restoration of prices to a basis of world parity. For a long time they had been much below actual replacement values, a condition that could not continue indefinitely.

"At a meeting in Houston on March 15, a general committee representing producing companies endorsed the Federal Oil Conservation Board's recommendation that the industry co-operate with Federal and State agencies for a complete organization of co-operative effort. It was reported to this meeting that the rate of production in the United States for 1928 was more than ample for the consuming needs of 1929, and in all likelihood sufficient for the requirements of several years to come.

"Economists recognize the fact that overproduction means an inevitable shortening of the life of our crude supplies and the waste of a valuable natural resource at the expense of the next generation. This situation cannot be remedied if curtailment be limited to domestic producing areas. Crude oil is so easily transported that any oversupply in foreign countries has the same effect on the world situation as though obtained in the United States. It is hoped, therefore, that whatever co-operative plans may be adopted by American producers will not be rendered ineffective by the policy followed in foreign producing fields.

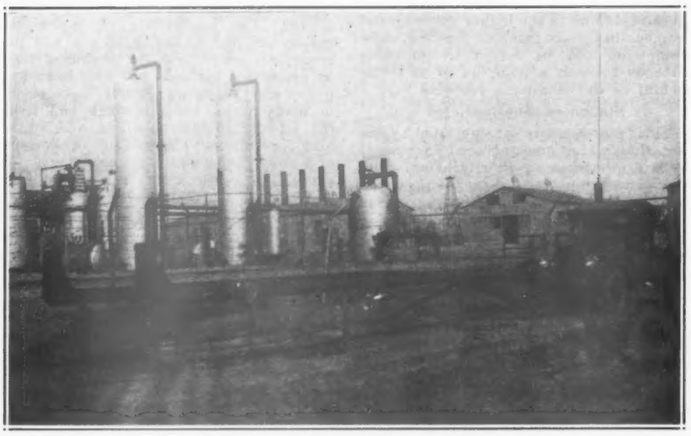
Limiting Waste

"Since the Royal Dutch-Shell companies have a substantial production in the United States, E. B. Reeser, president of American Petroleum Institute, and R. C. Holmes, chairman of the general committee, cabled Sir Henri Deterding an invitation to be present at the meeting this week.

"The sole purpose of the discussions which are taking place is to limit waste through uneconomic production. Both federal and state authorities were present at the meetings in Houston, and it is reported that the Federal Government will have an observer at the meeting in New York. In the event that the recommendation for restricting production to the 1928 basis is adopted by the directors of the American Petroleum Institute, it will be submitted to the Federal Oil Conservation Board, and, if approved by that body, the State authorities will be so advised and their co-operation requested.

"It would be disastrous to the public's interest to allow overproduction to increase as in the past few years."

JOINT OF 10-INCH CASING MADE THIS GREASING RACK



Employes at the Little River gasoline plant of the Gypsy Oil Co. wanted a rack for the convenient greasing and washing of their automobiles. A joint of 10-inch casing split into halves with a welding torch provided the runway, and some 2-inch pipe, with a few fittings, made a substantial frame for it to rest on.

EAST TEXAS PRODUCTION

Daily average production of the pools in East Central Texas during the past week follows:

Boggy Creek	4,493
Cedar Creek	155
Currie	486
Mexia	5,617
Minerva	705
Nigger Creek	382
Powell	8,369
Richland	437
Thrall	30
Wortham	1,270
Total	21,944
Total previous week	21,892
Increase	52

W. H. ISOM, SINCLAIR EXECUTIVE, IS DEAD

William H. Isom, director and member of the executive committee of the Sinclair Consolidated Oil Corp., died of pneumonia in his home in Garden City, Long Island, last Saturday. He had been in the oil business a half century. Funeral services were held Monday of this week and the executive offices of the Sinclair company were closed as a tribute to the dead executive, who had been active in the affairs of the concern till stricken a few weeks ago.

Mr. Isom, in 1898, drilled the first producing oil well in Oklahoma, and during the Alaskan gold rush at the end of the last century he became the active head in Alaska of the North American Transport and Trading Co., which was owned by the Cudahy packing interests of Chicago.

He entered the oil business in Toledo, Ohio, in 1879 as a jobber and there built the first oil refinery west of Cleveland. John D. Rockefeller bought him out in 1887, and for several years Mr. Isom had charge of all the Standard Oil interests in the northwest from Duluth, Minn., to Seattle.

In 1897, Mr. Isom became identified with Michael Cudahy, the Chicago packer, but when the Cudahy interests for a time went out of business, Mr. Isom went to Alaska.

He re-entered the oil business in 1908 with the Cudahy interests as active head of the Cudahy Refining Co. and built a refinery at Coffeyville, Kan. The Cudahy Refining Co. was merged with the Sinclair interests in 1916 and Mr. Isom became a director and member of the executive committee in the Sinclair corporation.

Mr. Isom was born November 27, 1859, in Champaign, Ill. He is survived by his widow and three children.

ROYALTY OWNERS ORGANIZING

SHREVEPORT, La., Mar. 26.—Preliminary to organization of a Louisiana-Arkansas division of the Mid-Continent Royalty Owners Association a meeting will be held here April 2 when it will be determined whether memberships from this division shall be through the general organization or whether the division shall be made an independent body, affiliated with the general organization. At a conference of royalty owners with representatives of the general organization, Art Carmody, S. L. Breene, L. M. Moffatt and A. J. Hodges were chosen to represent the Louisiana owners on the committee in charge of preliminaries, and F. R. Treat, P. R. Maddox and James H. Dugan, all of El Dorado, were selected to represent the Arkansas owners. The general organization was represented at the conference by Guy H. Woodward, general counsel; W. E. Cook, editor of the association's bulletin, "Royalty News," and W. T. Scott and F. B. Carden.

VETERAN OIL MAN DIES IN HIS HOME IN EAST

James W. Cunningham, a veteran even among the old-time oil men, and known during the early days of the industry throughout the eastern fields as "Stopcock Jim," passed away at his home at Roanoke, Va., recently. Mr. Cunningham worked through the different oil fields in the East and was especially well known in the Mannington, W. Va., territory. F. V. Faulkner, vice president and general manager of production of the Magnolia Petroleum Co., is one of the many present-day oil company executives Mr. Cunningham counted as an especially close friend. Mr. Cunningham was 84 years old.

CONSERVATION BILL PRESENTED IN KANSAS

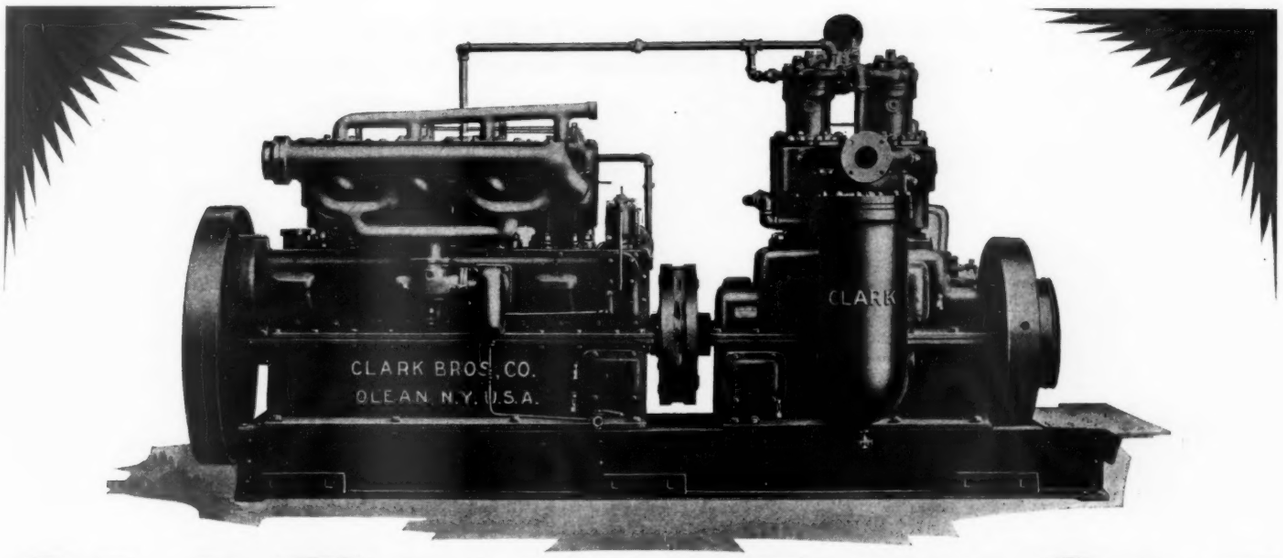
TOPEKA, Kan., Mar. 23.—House Bill No. 440, introduced by Baird of Cowley, provides that the production of natural gas, crude oil or petroleum in such manner and under such conditions as to constitute waste is prohibited. Producing of these products at a time when there is not a market demand therefore at the well, at a price equivalent to the actual value of such products, is prohibited. The actual value of such natural gas, crude oil or petroleum at any time shall be the average value as near as may be ascertained in the United States of any of the by-products when refined, less cost and a reasonable profit in the business of transporting, refining and marketing the same. The public service commission is authorized to investigate from time to time actual value of these products, determine their value, and publish its findings.

"Waste," in addition to its ordinary meaning, shall include economic waste, underground waste, surface waste, and waste incidental to the production of natural gas, crude oil or petroleum in excess of transportation or marketing facilities or reasonable marketing demands. The public service commission or its successor or successors shall have authority to make rules and regulations for the prevention of such wastes and for the protection of all fresh water strata and oil and gas bearing strata encountered in any well drilled for gas or oil. Whenever full production from any common source of supply can be obtained only under conditions constituting waste as defined by the act, each producer may take only such proportion "as may be produced therefrom without waste, as the production of the well or wells . . . bears to the total production of such common source of supply."

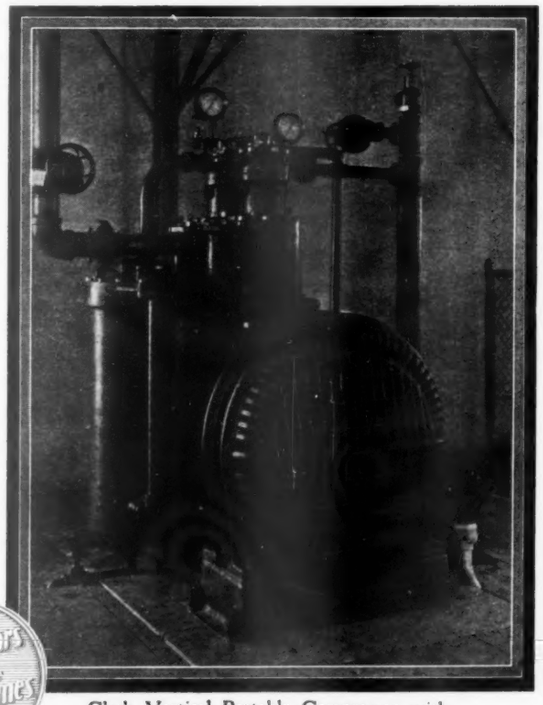
The commission shall regulate the taking of production from all such common sources of supply so as to prevent unfair taking, and to prevent unreasonable discrimination in favor of any one such common source of supply as against another. The commission shall prescribe and promulgate rules and regulations for determining proper production from wells. Any person, firm or corporation, or the attorney-general on behalf of the State, may institute proceedings before the public service commission or apply for a hearing before said commission upon any question relating to the enforcement of this act, and jurisdiction is hereby conferred upon said commission to hear and determine the same. Penalty for violation is fine not to exceed $5,000, or imprisonment not to exceed 30 days, or both. The act shall be in effect from and after publication in the statute book.

CRUDE OIL MOTOR

The Junkers Motorenbau G.m.b.H. of Dessau, Germany, reports that it has sold the license to manufacture its type of crude oil motor in France to the Societe Anonyme d'Automobiles Peugeot. It is reported that the Peugeot firm has formed a new company to produce this motor. Reports have also been current to the effect that a corresponding license has been sold to a British firm.



CLARK 'VERTICAL' SEMI-PORTABLE COMPRESSORS



Clark Vertical Portable Compressor with direct drive by electric motor—90 H. P., 400 R. P. M. Floor space 76"x53", height, 85", weight 11,000 lbs.

GAS ENGINE OR MOTOR DRIVEN

The CLARK Vertical Portable Compressors are now furnished with direct drive from either 4-cylinder vertical gas engine or electric motor. Here is unsurpassed usefulness for any compressor work where quick set-up at low cost is a factor.

The "Vertical" has either two or four vertical cylinders, two-stage or single-stage, 11" stroke. Get full information.

CLARK BROS. COMPANY
OLEAN, N. Y.

Branches and Warehouses; 125 West First St., Tulsa; McCamey and Sweetwater, Texas; and Artesia, N. M. Smith, Booth, Usher Company, 228 S. Central Ave., Los Angeles, and 50 Fremont St., San Francisco.

Of Interest to Sales Departments

EXPORT GAINS POINTS TO HEAVY GASOLINE DEMAND

NEW YORK, Mar. 23—Steadily expanding export demand for American automobiles, particularly in South America, is expected to be reflected in increased buying of American gasoline, lubricating oil, and greases in foreign markets, in the opinion of operators in the local export petroleum market.

Exports of automobiles from the United States in January of this year, according to figures just released by the Department of Commerce, established a new high record in value for the first month of any year, amounting to $47,563,655. This was $15,657,862, or almost 50 per cent, more than the value of shipments in January last year, and $11,534,409 over the value of shipments in December, 1928. In comparison with December, 1928, exports of passenger cars in January were 17½ per cent higher in number, increasing from 20,945, valued at $16,721,811, to 24,631, valued at $17,871,305. This increase was accounted for entirely by shipments in the low-price group under $1,000.

Truck exports in January were consistently above December in all classes, although the greatest increase was shown in trucks under one ton. Total truck shipments were close to 45 per cent above the figure for the preceding month, rising from 9,009, valued at $6,726,519, to 13,034, with a value of $7,964,531.

Argentina, which took 20 per cent of the passenger cars and 32 per cent of the trucks shipped from the United States in January, occupied the leading market position for both classes of motor vehicles. Australia, Canada, and British South Africa were the next leading passenger car markets, followed closely by Brazil and Germany, whose takings were substantially above those recorded in December, 1928. The average value of passenger cars shipped during January was $725. Australia was the second largest truck market, and Brazil, with an increase of 156 per cent over December, was the third market of importance. The average value of trucks exported in January was $611.

MARLAND BUYS TANKERS

NEW YORK, Mar. 23.—The Marland Oil Co. has purchased three tankers this week. Two, the Chester Sun and Sabine Sun, were purchased from the Sun Oil Co., and have carrying capacity of 73,000 bbls. each. The third, the Radiant, with about 30,000 bbls. capacity, was purchased from the Union Oil Co. of California. Marland recently purchased the refinery and marketing facilities of Prudential Oil Corp., Baltimore, and it is expected the larger tanker fleet will be used in carrying crude to the Baltimore plant. Just prior to the Marland deal, Prudential was reported in the market for 1,000,000 bbls. of California crude.

W.P.R.A. ENDORSES CODE

The Western Petroleum Refiners Association has gone on record as endorsing the code of ethics outlined by the American Petroleum Institute. In the resolution presented at the association's annual meeting in St. Louis there was but one member voting in opposition to it and two did not vote, stating they preferred first to get the opinion of the Federal Trade Commission regarding its practicability. There were approximately 40 members voting favorably on the resolution. The board of directors of the association later endorsed the work of the Oil Heating Institute in the form of a resolution.

NEW YORK LEADS ALL STATES WITH TWO MILLION CAR REGISTRATIONS

Utah with an increase of 24.5 per cent led all states in percentage increase in motor vehicle registration during 1928, according to a report compiled by the statistical department of Western Petroleum Refiners Association. The report shows that on the last day of 1928 New York State led with a total registration of 2,093,000 cars. California was second with 1,727,024 cars and Ohio third with 1,662,000 cars.

The following table gives the registration the first day and last day of 1928, the percentage increase and the average motor vehicle registration for the year:

	Motor vehicle registration Jan. 1	Motor vehicle registration Dec. 31	Per cent increase	Average Motor vehicle regist'n.
Connecticut	282,892	315,234	11.4	299,063
Delaware	46,707	51,210	9.6	48,959
District of Columbia	126,136	150,915	19.6	138,525
Maine	164,250	166,621	1.4	165,436
Maryland	284,267	234,849	*17.4	259,558
Massachusetts	696,107	757,720	8.9	726,913
New Hampshire	96,000	102,750	7.0	99,375
New Jersey	712,402	754,841	6.0	733,622
New York	1,900,866	2,093,792	10.1	1,997,329
Ohio	1,570,418	1,662,000	5.8	1,616,209
Pennsylvania	1,568,617	1,642,866	4.7	1,605,741
Rhode Island	119,335	126,918	6.4	123,127
Vermont	79,510	86,231	8.5	82,870
Total	7,647,507	8,145,947	6.5	7,896,727
Southeastern States—				
Alabama	243,539	255,850	5.1	249,695
Florida	391,168	358,063	*8.5	374,615
Georgia	296,567	318,180	7.3	307,374
Kentucky	285,099	305,291	7.1	295,195
Mississippi	227,103	235,826	3.8	231,464
North Carolina	422,544	486,000	15.0	454,272
South Carolina	199,794	216,964	8.6	208,379
Tennessee	295,530	325,406	10.1	310,468
Virginia	335,275	358,633	7.0	346,954
West Virginia	241,042	251,419	4.3	246,231
Total	2,937,661	3,111,632	5.9	3,024,647
Indiana Territory and Nebraska—				
Illinois	1,438,985	1,504,359	4.5	1,471,672
Indiana	813,496	843,092	3.6	828,294
Iowa	706,829	736,666	4.2	721,747
Michigan	1,156,344	1,248,080	7.9	1,202,212
Minnesota	640,102	668,155	4.4	654,129
Missouri	678,564	714,437	5.3	696,500
Nebraska	373,912	375,972	0.6	374,942
North Dakota	160,696	173,944	8.2	167,320
South Dakota	170,592	191,900	12.5	181,246
Wisconsin	698,944	743,815	6.4	721,380
Total	6,838,464	7,200,420	5.3	7,019,442
Mid-Continent States—				
Arkansas	206,568	217,960	5.5	212,264
Kansas	501,901	536,262	6.8	519,081
Louisiana	255,000	277,000	8.6	266,000
Oklahoma	644,450	585,346	*9.2	614,898
Texas	1,110,986	1,213,224	9.2	1,162,105
Total	2,718,905	2,829,792	4.1	2,774,348
Western States—				
Arizona	74,527	91,800	23.2	83,163
California	1,699,955	1,727,024	1.6	1,713,490
Colorado	268,026	245,260	*8.5	256,643
Idaho	103,000	108,931	5.8	105,965
Montana	112,756	127,442	13.0	120,099
Nevada	25,851	27,134	5.0	26,493
New Mexico	60,000	67,643	12.7	63,821
Oregon	246,623	254,415	3.2	250,519
Utah	78,976	98,541	24.8	88,759
Washington	389,409	408,156	4.8	398,782
Wyoming	52,222	56,867	8.9	54,545
Total	3,111,345	3,213,213	3.3	3,162,279
Grand Total—United States	23,253,882	24,501,004	5.4	23,877,443

*Percentage decrease.

GULF BUYS TANKERS

NEW YORK, Mar. 23.—Gulf Oil Co. has purchased three large ocean-going tank steamers from the Atlantic, Gulf & West Indies Steamship Lines, to supplement its fleet. The tankers involved are the Agwihavre, of 7,815 gross tons, with carrying capacity of 102,000 bbls., the Agwimex, of 8,862 gross tons, with carrying capacity for 102,000 bbls., and the Agwisun, of 6,784 tons gross, with carrying capacity of 76,000 bbls. These three steamers have been operated, under charter, by Gulf for several months, moving Venezuelan crude to Atlantic Seaboard refineries.

The Gulf fleet was recently augmented with the launching of three modern tankers, now in operation. They are the Gulfbird, Diesel driven, of 10,208 gross tons, with carrying capacity of 130,000 bbls.; the Gulfhawk, Diesel driven, of 10,208 gross tons, with carrying capacity of 132,000 bbls., and the Gulfwing, also Diesel powered, and of the same tonnage and carrying capacity of the Gulfhawk. With these three tankers, and not including the three vessels just taken over from A.G.W.I., the Gulf fleet comprises 25 ocean-going tankers, of 169,647 gross tonnage, with total carrying capacity close to 2,000,000 bbls. All of these vessels are under American registry.

FIRST MARLAND SHIPMENT

Union Oil Co. recently announced the sale of its tank steamer Radiant to the Gladstone Transportation Co. of New York, a subsidiary of the Marland Oil Co. The tanker was loaded immediately with cargo and sailed east on March 1 under command of Capt. J. W. Kelly, former chief officer of the tanker Dartford, and with M. B. Massey, also off the Dartford, as chief engineer. She carried a crew of 27. Built on the Atlantic Coast in 1913, the Radiant was bought by the Union Oil Co. four years ago and since has been running coastwise out of Los Angeles, with occasional trips to Alaska and to Hawaii with refined products and fuel cargo.

STANDARD HAS NEW TYPE AIRPLANE SERVICE TRUCK

Among a number of new developments shown in lantern slides and described at a recent meeting of the Pennsylvania section of the Society of Automotive Engineers by J. W. Winchester, superintendent of motor equipment of the Standard Oil Co. of New Jersey, is a tank truck for fueling airplanes. High grade fuel is pumped up through a meter to the airplane tank, no cans being used. Lubricating oil tanks are carried at the sides of the fuel tank, and an air pump is provided for inflating the airplane tires. Water can also be supplied, if necessary.

Another development is a novel frameless tank truck of about 2400 gallons capacity, the design for which was worked out by certain truck makers only after a great deal of difficulty was experienced in inducing them to undertake it. One of the experimental trucks has run approximately 70,000 miles and another has run 30,000 miles. These trucks, said Mr. Winchester, haul trailers, the combined capacity of a truck and trailer being 7000 gallons.

Rubber shock absorbers are used in the truck fifth wheel and in the rear spring hangars. The design has reduced operating costs, as it has been possible to haul about one-third greater loads. Where the state laws permit, the six-wheel unit hauls a four-wheel trailer, and it is possible to make a large saving as against freight rates.

In another truck, a tank is mounted on a three-point suspension on the chasis, which has proved very successful in avoiding frame breakage in the larger trucks. Three-point suspension of cabs also has prolonged the life of the cabs.

NEW SHELL BARGE

Contract for the construction of a 7,000-bbl. steel bunkering barge for the Shell Oil Co. of California has been awarded to the San Pedro plant of the Bethlehem Shipbuilding Corp., located at Los Angeles harbor. Construction will begin some time this month.

The new barge will be the most modern in the port, being equipped with new high-speed pumps, driven by Atlas-Imperial Diesel engines for quick loading of the fuel tanks of ships in port, either at dock or at anchor. It will have an overall length of 131 feet, a beam of 40 feet and a draft of 11 feet 6 inches.

TANKER MARKET UP

NEW YORK, Mar. 23.—The tanker market this week has experienced the most active trading and the sharpest price advances of the year. Seven fixtures were reported in one day, March 14. Four were for two trips each, making an equivalent of 11 fixtures for the day. All of the inquiry has been for movement from the Gulf to North Atlantic. The rate has advanced for the week from 27 cents to 30 cents per barrel on dirty tankage for movement from the Gulf to north of Hatteras. Little trading is reported in the intercoastal market, and transcontinental tonnage is also slack.

RICHFIELD FOREIGN SHIPMENT

When the Danish tramp steamer Uranienborg recently left Los Angeles harbor it took 140,000 cases of gasoline, together with consignments of other petroleum products, which the Richfield Oil Co. is sending to the Gold Coast of East Africa in a pioneering effort for the American oil industry. Sailing westward, with a bunkering stop at Borneo, the Uranienborg will discharge at Mauritius, Zanzibar and Gold Coast ports.

PROGRESS

Changes in modes of living that affect the general public are naturally given much publicity and are immediately understood and accepted. But equipment such as Vogt Drop Forged Steel Valves and Fittings which have developed steadily in design and nature of materials with the increasing pressures and temperatures of modern demands is known only to actual users.

Progress in the manufacture of Vogt Drop Forged Steel Valves and Fittings is the underlying cause of many improvements and greater possibilities in design of equipment on which they are used.

The Vogt F-6 Catalog depicting a most complete line of Vogt Drop Forged Steel Valves and Fittings will be sent on request.

4"-1350 lb. A. E. S. C. Standard Globe or Gate Valve with flanges forged integral with body.

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Important Decision in Cracking Case

United States Circuit Court of Appeals Renders Decision in Suit of Universal Company vs. Skelly Company

The United States Circuit Court of Appeals for the Third Circuit has rendered a decision in the case of the Skelly Oil Co. defendant-appellant against the Universal Oil Products Co., plaintiff-appellee involving an alleged infringement of patents of the Universal company in the operation of the Jenkins cracking process. The Universal company is the owner and licensee of what is commonly known as the Dubbs process.

The decision of the United States District Court in Delaware was in favor of the plaintiff and an appeal was taken by the defendant company. The appeal judges were Judges Buffington, Woolley and Davis. Following is the decision as rendered by Judge Woolley:

Speaking of the parties as they stood in the trial court, the plaintiff, owner of Letters Patent No. 1,281,884, issued in 1918 to M. J. Trumble, brought this action against the defendant (Skelly Oil Company) for infringement of claims 1, 2, 3 and 4. Against the defense of want of invention, anticipation and non-infringement of the trial court found the four claims in suit valid and process claim 2 and apparatus claim 4 infringed. 23 Fed. (2d) 111. The defendant took this appeal which is directed, and limited, to validity and infringement of the latter two claims under the same defenses.

The Trumble patent relates to the art of refining petroleum oils and purports to provide a process and apparatus by which petroleum oils of high specific gravity (heavy oils) may be converted into oils of low specific gravity (light oils) at a saving of cost. More particularly, the invention relates to that branch of the art of refining petroleum oils known as "cracking." The art is old and as Trumble's invention is an improvement upon one of its late developments it will be necessary to state the art in outline in order to understand what Trumble did in an inventive way and what he accomplished.

Crude petroleum consists of a complex mixture of hydrocarbons differing in specific gravity. Stated according to the range of their specific gravity from low to high, they are incondensible gases, gasoline, kerosene, gas oil and lubricating oil, leaving fuel oil, tar, pitch, asphalt or coke as a residue. These closely combined mixtures may be physically separated and recovered at atmospheric pressure by progressive vaporization at their respective boiling points through the familiar process of fractional distillation practiced in many arts. Air Reduction Co. v. Carbo-Oxygen Co., 17 Fed. (2d) 138; 19 Fed. (2d) 1,014; Southern Electro-Chemical Co. v. duPont Company, 20 Fed. (2d) 97, 101, So, also they may be recovered by cracking. But cracking is an operation wholly different from fractional distillation. It involves a chemical reaction and effects a partial conversion, or breaking up, of the complex hydrocarbon molecules of the heavier constituents of the mixture, by the application of heat and pressure, into the molecular structure of the desired lighter distillates, for instance, gasoline, the one now greatly demanded of the industry and chiefly concerned in this litigation. An unavoidable incident of the cracking process, however, is that the rearrangement of molecules yields free carbon and heavier oil and expells some incondensible gases which are not desired because of little value and mainly because they add to the cost and danger of producing the valuable light distillates, particularly of producing gasoline, which requires more heat (about 750° F.) and higher pressure (about 75 pounds) than in producing kerosene, the heavier distillate, whereby these unwelcome by-products are increased correspondingly.

Tar, coke and foreign matter, inevitably produced in some degree in every cracking operation, are more than undesirable; they are highly objectionable for two reasons; one, they accumulate on the heating surface of the still and thus retard the transfer of heat to the oil and, what is more serious, they cause overheating of the still walls with consequent danger of leaks, blowouts and fire; and the other, as the operation must from time to time be stopped and the still, thus idle, be cleaned out, they determine the length of the run or time the still may remain "on stream," that is, the time the still is in operation and earning money. To meet these problems the art progressed on lines and developed oil cracking devices and procedures differently stated by the opposing parties. These differences can, by some elaboration, be reconciled.

Defense Claims

The defendant divides devices and procedures of the art before Trumble into two classes:

(a) Bulk-oil cracking in boiler stills;

(b) Stream-oil cracking in coil stills;

claiming that its practice is within the former and Trumble's within the latter and in view of the latter lacks invention.

The plaintiff divides the devices and procedures of the art prior to Trumble into three classes:

(a) The directly fired shell or batch still;

(b) The once through still or system;

(c) The cycle still or system;

and claims that Trumble's method and apparttus are improvements upon the last; that, in view of what had gone before, they involve invention; and that the defendant's practice also comes within the last as improved by Trumble, and infringes.

The essential features of a directly fired, or batch, still are shown in the late Burton still (Patent No. 1,049,667 issued in 1913.) It comprises a cylindrical shell or boiler, charged about one-half full with oil, the heating flames playing directly on the bottom sheets. The generated gases arise in the vapor space above the oil. The heavier vapors are condensed and return to the still while the lighter vapors pass to a coil condenser, whence, after condensation into liquid, they are conducted to a receiver and there recovered.

It is important to note that in the operation of a batch still no residue is taken off during the run; that a still of this type can remain on stream only about 36 hours; that it must then be shut down, the tar, coke and foreign matter removed and the bottom scraped; that it takes about 24 hours to clean out the still, and that this involves substantial cost and operative loss. Antecedent variations of the set-up of the Burton batch still may be found in Letters Patent No. 419,931 to Dewar and Redwood, 1890; No. 28,246 to Atwood, 1860; and No. 52,151 to Fales, 1866.

Next, the art thought that sedimentation of foreign matter upon the walls of a still with its consequent physical and financial disadvantages could be avoided, or at least lessened, if the oil were moved over the heating surface so rapidly that there would not be time for the matter to settle. So there developed the "once through" still, which takes its name from what happens in the still. Of this type patents No. 342,564 and 342,565 to Benton in 1886 are fair disclosures. Briefly described, this set-up comprises a furnace with a pipe positioned above the flames and extending throughout and beyond the furnace length. Oil is fed into the pipe at one end, through an opening in the pipe intermediate the two ends lighter vapors flow into a releaser and then are conveyed into a condenser and what is left of the oil is discharged from the other end of the pipe. It should be observed that oil passes through the heating medium once, hence the term "once through." It is therefore heated only once, and then in transit. There were several infirmities in this system; one, the loss of heat attendant upon the single passage of the oil through the pipe; the other, incomplete cracking in one passage with consequent loss of the residue or cost of retreatment.

Systems of this type are described in one of the set-ups in the Russian patent No. 4,782 to Schuchow and Gavrilow, 1891; patent No. 27,842 to Stombs and Brace, 1860; showing a battery of directly fired shell batch stills with a continuous bulk-oil flow and discharge, circulation increased by patent No. 340,878 to Henderson, 1886; No. 477,153 to Pielsticker, 1892, as to one phase.

Whether or not the once through system was an advance step in the art, clearly it was a step away from the batch still, and it is to be credited with the kernel of a new and later, very useful conception. As the feed and discharge of the once through system are continuous and vaporization likewise is continuous, it became one of two systems embodying the idea of continuous operation, the other being the cycle system.

Type of Still

The cycle type of still, like that of the once through type, derived its name from what happens inside. In the process of being cracked, oil moves in a cycle and the organization of the still is adapted to produce such a movement. The apparatus disclosed in connection with the method patent to Clark, No. 1,119,496, an improvement on Burton, issued in 1914, is a simple illustration. There, oil in an elevated reservoir located away from the furnace descends to a pump whence it is forced through a pipe to a coil within a furnace; ascending, it returns heated to the reservoir from which it started and continues on and on in this cycle while the resultant vapors pass from the top of the reservoir through a pipe to a condenser and finally to a drum for receiving the distillate. No residuum is taken off during the on-stream operation. The Clark-Burton set-up seems to be a commercial adaptation of the Clark invention. Here, too, no residuum is drawn off when on stream. While an improvement on the batch and once through systems, the cycle system also must be shut down for cleaning certain of its parts, in this instance after a run of approximately 48 hours, an increase of 12 hours over the batch still run.

The Russian patent, supra, will be discussed in some detail under another issue. It will be enough to say now that its second set-up discloses a cycle movement of oil with the usual drawing off of vapors but no drawing off of the residuum during a run.

It was just here that Trumble appeared and proposed an improvement upon the cycle system by recirculating the heavy uncracked oil and doing it in a way to draw off in large measure the objectionable free carbon, tar and other foreign matter. What he did, and apparently all he did, was to take a typical cycle system with furnace, heating coils, condenser, pump, etc., and after suitably arranging them, disclose a practice and suggest a means continuously to draw off a small portion of the revolving residuum (loaded with the objectionable matter) in each of its cycles through the closed system and replenish the bulk with an equal

FILE ADDITIONAL SUITS INVOLVING PATENTS TO OIL CRACKING PROCESSES

The Universal Oil Products Co. of Chicago, owners of the Dubbs cracking process, has filed suit in the United States District Court of Delaware against the Winkler-Koch Engineering Co. and the Root Refining Co. A similar suit also has been filed against the Winkler-Koch Engineering Co. and the White Eagle Oil & Refining Co. The suits are based on the alleged installation of cracking stills at the refineries of the White Eagle and Root companies by the Winkler-Koch company.

Following is the petition filed in the suit against the Winkler-Koch Engineering Co. and the Root Refining Co.:

1. The plaintiff, Universal Oil Products Company, is a corporation organized and existing under and by virtue of the laws of the State of South Dakota, having a regular place of business in the City of Chicago, County of Cook, and State of Illinois, and the defendant, Winkler-Koch Engineering Company, is a corporation organized under the laws of the State of Kansas, and has a regular place of business in the City of Wichita, in the County of Sedgwick, and the State of Kansas, and the defendant, Root Refining Company, is a corporation organized and existing under the laws of the State of Delaware, and that in the District of Delaware, as well as elsewhere in the United States the infringing acts hereinafter complained of have been and are being committed by said defendants.

2. That this is a suit in equity brought under the Patent Laws of the United States for the infringement of Letters Patent of the United States, the entire right, title and interest in which are owned by the plaintiff herein, said Letters Patent being as follows: Patent No. 1,378,307, patented May 17, 1921, to W. H. Young, for Apparatus for Cracking and Refining Petroleum Products; Patent No. 1,484,445 patented February 19, 1924, to C. P. Dubbs, for Method of Treating Hydrocarbons; Patent No. 1,534,927, patented April 21, 1925 to C. P. Dubbs, for Method for Treating Hydrocarbon Oils; Patent No. 1,537,593, patented May 12, 1925 to Gustav Egloff, for Process for Cracking Oil; Patent No. 1,602,990, patented October 12, 1926 to Robert T. Pollock, for Process for Converting Hydrocarbons; and, Patent No. 1,686,654, patented October 9, 1928 to C. P. Dubbs, for Method for Treating Hydrocarbon Oils.

3. That on the prior to the 5th day of November, 1927, said W. H. Young, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of Apparatus for Cracking and Refining Petroleum Products, not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof for more than two years prior to his application for Letters Patent in the United States therefor, and no application for any foreign patent was filed more than twelve months prior to the filing of the application for Letters Patent in this country which issued into Letters Patent No. 1,387,307, and which improvements had not been in public use or on sale in the United States for more than two years prior to his application for Letters Patent therefor and not abandoned to the public.

4. That on the 5th day of November, 1917, the said W. H. Young made and filed an application in writing to the Commissioner of Patents for the grant of

(Continued on Page 164)

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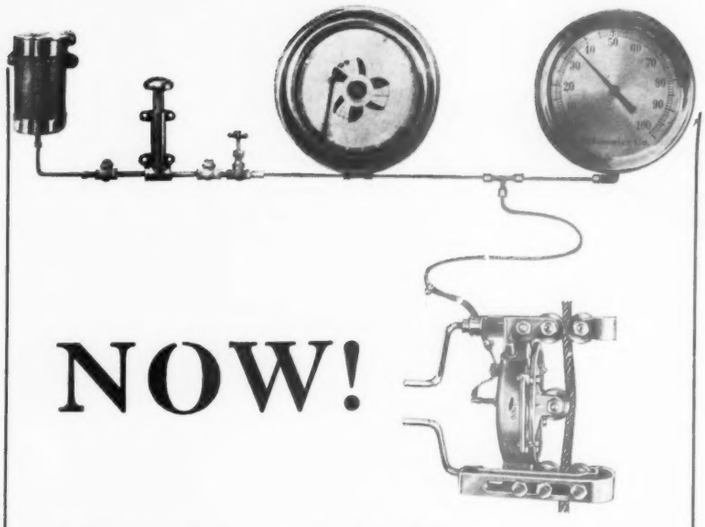

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amount of new oil stock and thereby maintain the bulk constant in volume. That was all. What was the result? An increase in a run from 48 hours to 17 days. For this he was awarded the patent in suit, claims 2 and 4, in issue, reading as follows:

"2. The process of converting a heavy petroleum oil into a light one which consists in circulating the heavy oil through a closed ring, continuously heating a portion of the ring, maintaining a pressure on the portion of the ring so heated, continuously taking off light vapors from the ring, continuously relieving the ring of a small amount of heavy oil, and continuously supplying fresh oil in sufficient quantities to maintain constant the volume of oil in the closed ring."

"4. An apparatus for converting heavy petroleum mixtures into light petroleum oils, comprising a heating means; a vapor releaser; means for conducting the heated mixture from the primary heating means to the vapor releaser; means for withdrawing light vapors from the vapor releaser; means for continuously withdrawing a portion of the mixture; means for forcing the residuum from the vapor releaser through the primary heating means; and means for injecting sufficient fresh heavy oil into said residuum to maintain the volume of oil in the apparatus approximately constant."

Trumble's invention resides not in the cycle movement of oil in a closed system or structure, for that was old, but in drawing objectionable foreign matter out of the system by continuously discharging or drawing off a portion of the degraded oil as it circulates with the foreign matter in suspension and continuously feeding back an equal amount of fresh oil whereby the bulk of oil in the system, thus continuously changing in quality, shall all the while be kept constant in quantity as it goes around and around in the closed system, which Trumble called "a closed ring." Trumbles closed ring as described in the patent comprises a feed pipe constantly charging fresh oil into a heated coil located in a furnace above the flames where the oil is heated to cracking temperature; a pipe leading from the coil and conveying the heated oil and vapors to a releaser from which the vapors are drawn off and through which the residue of heavy oil descends to another pipe having an outlet through which a portion of the heavy oil is drawn out of the system and the balance is returned to the heating coils where it joins the main body of oil refreshed by new oil from the feed pipe and then proceeds on another cycle; circulation of the always changing bulk being effected at a determined speed by a pump. If this is not a mere variation of what already existed in the art but is new in that it is something abruptly different from what existed before, then, utility being evident, the patent is not invalid for want of invention in view of the art. The plaintiff declares, again and again, that no process or apparatus in the prior art operating on the cycle system used or embodied these elements, and that Trumble was the first to realize that the period of a run of a cycle system with its attendant advantages could be materially lengthened by continuously withdrawing from the ring tn appropriate amount of tar and coke bearing oil and providing a continuous supply of fresh charging stock. The defendant has not successfully met, nor have we found anything in the evidence, that contradicts, these assertions. Therefore we find invention and, on the record before us, hold the claims of the patent which are in suit valid in view of the art—unless, as the defendant next urges, they are invalid because anticipated by the art.

Prior Art

The defendant says that the claims of the Trumble patent, as the District Court interpreted them to include its practice, are directly anticipated by United States patents No 340,878 granted to Henderson in 1886; No. 1,170,884 granted to Edwards in 1916 after the date of Trumble's application on an application filed May 8, 1915, which was before Trumble's application on July 19 of the same year; No. 1,239,424 granted to Smith September 4, 1917, on an application filed April 28, 1915; No. 836,732 granted to Barbet in 1906, and a corresponding French patent granted to him in 1902; and finally the Russian patent (No. 175) granted to Schuchow and Gavrilow in 1891.

The Barbet patents disclose a directly fired shell batch still having a continuous feed of charging stock and a continuous drawoff of residuum actuated by a "stirrer" mounted in the shells. They do not disclose oil of changing quality circulated through a closed ring or anything that told the art precisely or substantially what Trumble told it. These references do not meet the evidentiary rule of anticipation.

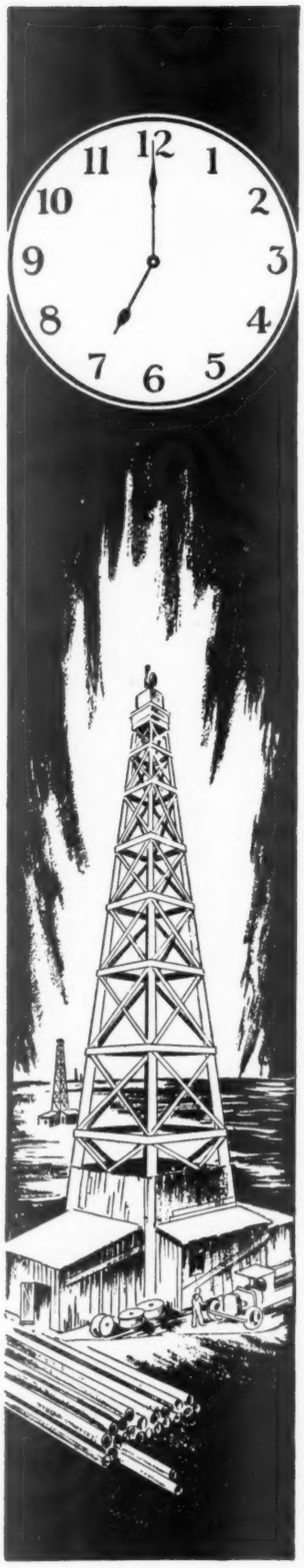
The Edwards and Smith patents are held not to anticipate on a finding that, if covering the same subject matter, their earliest dates of invention were later than Trumble's.

Henderson added to the Stombs and Brace continuously operated battery of directly fired batch stills a means "to promote circulation" in the form of revolving blades, dishes, or buckets hinged to the side walls of the stills. Although the patent deals with "circulation" we fail to find a true cycle system disclosed. While the dishes or buckets may reduce sedimentation and aid circulation in the sense of promoting the oil movement, their operation more nearly resembles agitation than circulation.

The defendant places its main reliance for proof of anticipation on the Russian patent to Schuchow and Gavrilow. Primarily, and according to the patent title and disclosure, the system is a "continuous" one but, as noted before, a continuous system may be either a cycle or a once through system. The patent discloses both. Each acts independently of the other and for different purposes according to the will of the operator.

However read, the patent discloses alternate systems. The oil comes in from a pump at B, passes through the pipe C, thence up through helical heating coils into a cylinder A, from which, after the light vapors have been drawn off through the pipe E, it descends as reflux condensate through the pipe D at whose bottom it may be drawn off at the valve P. That, falling a little short of a single cycle or revolution, is a once through system. Or valve P may be closed and the oil shot back through valve R to the pipe B whence, continuing through pipe C, the oil may be recirculated through the system indefinitely. That is a cycle system. As to these two systems the applicable words of the patent are: "In accordance with the speed of circulation of the oil in the pipes, and depending on the purpose of the distillation, the liquid oil which has settled in the cylinder A is discharged by the pipe D and through the valve P, without being subjected to further distillation, or by valve Q enters the pump once more, where it is mixed with a new supply of oil running towards the pump, and resumes circulation through the coiled tubes." If, in the second set-up, the "new supply of oil running towards the pump" be a "continuous feed," we find no reference to a corresponding continuous bleed. There is of course a continuous diminution of the bulk by evaporation.

It would seem that the patent thus discloses only two methods of operation, alternate and optional with the operator. But the defendant says that the apparatus is capable of a third method, namely: the simultaneous opening of both valves P and Q a little bit whereby through the former a portion of the degraded oil will be drawn off and through the latter the remainder (refreshed by new stock) will be carried back through the system and recirculated. Looking at the diagram submitted as an illustration, this would seem to be possible, but we find no such conception or use disclosed by the patentees. The defendant emphasizes these words of the patent: "In this manner, by means of the valves P and Q a greater or less degree of a repeated process of circulation is obtained, as also of the distillation or cracking of the oil." The "manner" there referred to is the alternative manner of operation described in the sentence last quoted and immediately preceding this sentence. We



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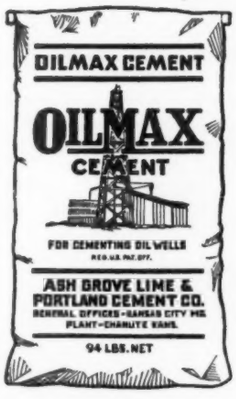

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think the two sentences, being placed together, should be read together and when so read they do not suggest a third system.

This third system proposed by the defendant is really a composite of the two systems described by the patent. It is only by combining these alternative systems, with their alternative valves P and Q, that the defendant produces Trumble's continuous bleed and feed.

As there is no evidence of the use of the invention of the Russian patent in the practical art, we are limited for information to the disclosures of the patent itself. Does the patent disclose this third practice? We find nothing to that effect. Does it teach that both valves P and Q should be opened simultaneously, one to draw off some of the oil loaded with impurities and the other to replenish the bulk, and together permit a continuous recirculation of the old and new? We cannot find that it does. Nor does the patent state the practicability or desirability of the third practice? Apparently it never occurred to the patentees. The defendant's conception of the third method is only an inference from the specification. Inferences as distinguished from disclosures, especially when drawn in the light of after events, cannot be accepted as a basis of anticipation.

A patent relied upon as an anticipation must itself speak. Its specification must give in substance the same knowledge and the same directions as the specification of the patent in suit. Otto v. Linford, 46 L. T., N. S. 35, 44. It is not enough to prove that a method or apparatus described in an earlier specification can be made to produce this or that result. Flour Oxydising Co. v. Carr & Co., 35 R. P. C. 457. A singularly sensible test of the rule of anticipation is given in British Thompson-Houston Co. v. Metropolitan Vickers Electrical Co., 45 R. P. C. 22, by asking the question—"Would a man who was grappling with the problem solved by the patent attacked, and having no knowledge of that patent, if he had had the alleged anticipation in his hand, have said: "That gives me what I wish.'" The Pope Alliance Corporation v. The Spanish River Pulp & Paper Mills, Ltd. (Privy Council Appeals No. 33 or 1928.) On the evidence in this case, read in the light of the rules of law applicable to anticipation, we do not find the invention of the patent in suit anticipated.

It is difficult to state the issue of infringement without repeating the evidence and reproducing the diagrams of the contesting apparatus. Omitting details, the defendant's set-up comprises the usual elements of furnace, heating means, dephlegmator, connecting pipes and pump. In place of either coiled tubes or shell still as a heating means the defendant uses a modern high pressure Babcock & Wilcox boiler with its familiar bank of inclined tubes in which is heated and cracked a very large volume of oil. The Trumble patent discloses a long coiled pipe as a heating means in which the volume of oil is not large. Since the form and size of the heating element of the invention are not claimed by the patent as novel and as they have nothing to do with the essence of the invention, the defendant's substitution of one kind of heater for that preferably or incidentally disclosed by the patent falls out of the issue of infringement.

Operating Procedure

Oil is fed to the defendant's system through a pipe leading into the dephlegmator through which, gathering heat in transit, it descends to the boiler, or rather to a drum on one side of the boiler, whence by force of a propellor pump it ascends through the battery of inclined tubes, subjected to flames from the furnace, to another drum on the other side, then ascends to the open space in the upper part of the boiler and thereafter revolves around and around within the boiler at a very rapid speed. The vapors arising from the surface of the bulk of oil in the upper part of the boiler, away from the flames, ascend through a pipe to the dephlegmator from which they are drawn off and the unsuccessfully cracked residuum is returned, as in other cycle systems, to the boiler and there, joining the rapidly moving bulk of oil, it is again subjected to the oil cracking temperature. Except as to the type of heater, the defendant's set-up thus far described discloses the main characteristics of the Burton batch still and Clark's cycle improvement upon it. If the defendant had stopped there it would not have infringed Trumble. But to the operative essentials of Burton and Clark, or, speaking generally, to the essentials found in prior systems, the defendant made at least one very important addition. This was an outlet from the second drum through which it continuously drew off a quantity of degraded oil equal to fresh oil which it injected continuously through the inlet in another part of the system. This addition to the defendant's otherwise unoffending set-up manifestly constituted a drawoff or bleed closely akin to that of Trumble. Even so, the defendant, while admitting a continuous circulation of oil coupled with continuous feed of fresh oil and continuous drawoff of heavy residuum, centers its position on the cycle within the boiler and maintains that its system retains the characteristics of bulk-oil process in boiler stills and is not a true cycle within the sense of Trumble's closed ring because the circulation is through the battery of heated tubes and the vapor releaser part of the boiler where alone, it says, heating and cracking occur, and because its cycle is only a cycle of movement while in Trumble's system the oil is subjected to a cycle of varied process steps. We have not been able to follow this line of reasoning for, as it seems to us, there are in the defendant's set-up really two cycles, one within the other; each, if considered apart from the other, having a continuous drawoff and feed in a closed system. One cycle is within the boiler or heater itself, on which the defendant lays stress as a bulk-oil process in a boiler still, for it is there the bulk of the oil is circulated and cracked and there it receives all the heat it ever receives; but over and beyond the cycle movement of oil in bulk within the boiler there is another cycle movement of oil and vapors under different conditions of heat and undergoing different treatment. This cycle is the movement from the boiler to the dephlegmator, and, after the vapors have there been withdrawn, the movement of the residuum back to and through the boiler for treatment.

As the defendant's system is not restricted to the boiler but extends to and embraces the other elements, it appears to be a true cycle system differing from other such systems in the character of boiler or heater employed and distinguished from others mainly by the larger bulk of charging stock, but resembling Trumble in the addition of a continuous feed and bleed in a measure that maintains the charge in constant volume as it revolves in a closed ring, of which the boiler is only a part. True, the defendant feeds and withdraws a larger quantity of oil than Trumble suggests in his specification, but as the claims contain no limitation upon the quantity, that will not avoid infringement. We are constrained to find that by its practice and set-up the defendant has infringed process claim 2 and apparatus claim 4 of the patent.

The decree of the District Court is affirmed.

A true Copy:
Teste:
Clerk of the United States Circuit Court of Appeals for the Third Circuit.

ADDITIONAL SUITS INVOLVING PATENTS

(Continued from Page 160)

Letters Patent of the United States upon the said invention or discovery of Apparatus for Cracking and Refining Petroleum Products, said application bearing serial No. 200,389; that the invention of said application and any Letters Patent to be issued thereon were duly assigned to plaintiff, Universal Oil Products Company; that on the 17th day of May, 1921, all of the requirements of the Statutes of the United States then in force and the rules of the Patent Office of the United States then in force

having been compiled with, Letters Patent of the United States No. 1,378,307 for Apparatus for Cracking and Refining Petroleum Products were duly issued on said application to said W. H. Young and were thereafter duly assigned in writing by mesne assignments to this plaintiff; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United States Patent Office, signed by the Commissioner of Patents and duly recorded in the Patent Office, and were so issued after due examination as to the novelty, patentability and utility of the invention therein described and upon payment of the fees required by law; and that the said Letters Patent granted to the said W. H. Young, his legal representative or assigns for the full term of seventeen years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

5. That on and prior to the 18th day of November, 1914, C. P. Dubbs, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of a certain new and useful Method of Treating Hydrocarbons not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof or more than two years prior to his application for Letters Patent therefor and no application for any foreign patent having been filed more than twelve months prior to the filing of the application for Letters Patent in this country and which improvements had not been in public use or on sale in the United States for more than two years prior to his said application for Letters Patent therefor which issued into Letters Patent 1,484,445 and not abandoned to the public.

6. That on the 18th day of November, 1914, the said C. P. Dubbs made and filed an application in writing to the Commissioner of Patents for the grant of Letters Patent in the United States upon the said invention or discovery of Method of Treating Hydrocarbons, said application being serial number 872,698, that the invention of said application and any Letters Patent be issued thereon were duly assigned to plaintiff, the Universal Oil Products Company; that on the 19th day of February, 1924, all of the requirements of the statutes of the United States then in force and the rules of the Patent Office of the United States then in force having been complied with, Letters Patent of the United States No. 1,484,445 for Method of Treating Hydrocarbons were duly issued on the said application to plaintiff, Universal Oil Products Company as assignee of the inventor, C. P. Dubbs; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United States Patent Office signed by the Commissioner of Patents, duly recorded and delivered to the plaintiff, the Universal Oil Products Company, and were so issued after due examination as to the novelty, patentability and utility of the inventions therein described and payment of the fees required by law; and that the said Letters Patent granted to the plaintiff, the Universal Oil Products Company, its legal representatives or assigns for the full term of 17 years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

7. That on and prior to the 21st day of December, 1917, C. P. Dubbs, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of a certain new and useful Method for Treating Hydrocarbon Oils not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof for more than two years prior to his application for Letters Patent therefor and no application for any foreign patent having been filed more than twelve months prior to the filing of the application for Letters Patent in this country and which improvements had not been in public use or on sale in the United States for more than two years prior to his said application for Letters Patent thereof which issued into Letters Patent 1,534,927 and not abandoned to the public.

8. That on the 21st day of December, 1917, the said C. P. Dubbs made and filed an application in writing to the Commissioner of Patents for the grant of Letters Patent in the United States upon the said invention or discovery of Method for Treating Hydrocarbon Oils, said application bearing serial No. 208,206, that the invention of said application and any Letters Patent to be issued thereon were duly assigned to the plaintiff, the Universal Oil Products Company; that on the 21st day of April, 1925, all of the requirements of the statutes of the United States then in force and the rules of the Patent Office of the United States then in force having been complied with, Letters Patent of the United States No. 1,534,927 for Method for Treating Hydrocarbon Oils were duly issued on the said application to plaintiff, Universal Oil Products Company as assignee of the inventor, C. P. Dubbs; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United States Patent Office signed by the Commissioner of Patents, duly recorded and delivered to the plaintiff, the Universal Oil Products Company, and were so issued after due examination as to the novelty, patentability and utility of the inventions therein described and payment of the fees required by law; and that the said Letters Patent granted to the plaintiff, the Universal Oil Products Company, its legal representatives or assigns for the full term of seventeen years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

9. That on and prior to the 9th day of December, 1920, Gustav Egloff, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of a certain new and useful Process for Cracking Oil not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof or more than two years prior to his application for Letters Patent therefor and no application for any foreign patent having been filed more than twelve months prior to the filing of the application for Letters Patent in this country and which improvements had not been in public use or on sale in the United States for more than two years prior to his said application for Letters Patent thereof which issued into Letters Patent 1,537,593 and not abandoned to the public.

10. That on the 9th day of December, 1920, the said Gustav Egloff made and filed an application in writing to the Commissioner of Patents for the grant of Letters Patent in the United States upon the said invention or discovery of Process for Cracking Oil, said application bearing serial No. 429,319; that the invention of said application and any Letters Patent to be issued thereon were duly assigned to plaintiff, the Universal Oil Products Company; that on the 12th day of May, 1925, all of the requirements of the Statutes of the United States then in force and the rules of the Patent Office of the United States then in force having been complied with, Letters Patent of the United States No. 1,537,593 for Process for Cracking Oil, were duly issued on the said application to plaintiff, Universal Oil Products Company as assignee of the inventor, Gustav Egloff; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United

12-inch River Line after being hauled across---a Greenspon Odee pipe line being installed near Calgary, Alberta, Canada. Anything but easy, these river-crossings on line construction. When you strike such a job you're thankful to have Odee double-length pipe. Those double-lengths cut the worst of the work in half. Broadly guaranteed, too!

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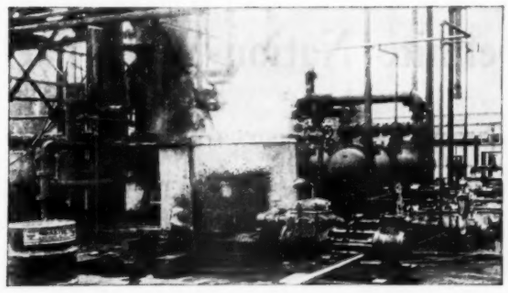

Cleans cooler tubes to the metal

GASOLINE absorption plants can increase cooling efficiency and obtain a better yield by keeping oil coolers clean the Oakite way.

Circulating a solution of an Oakite material through the tubes is all that is necessary. Sludge and deposits are quickly loosened and flushed out, cleaning the tubes right down to the metal. Heat transfer is increased—circulation resistance removed.

The Oakite Service Man near you will be glad to give you all details for this and many other refinery cleaning jobs—without obligating you in any way. Write us to have him call.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada.

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States Patent Office signed by the Commissioner of Patents, duly recorded and delivered to the plaintiff, the Universal Oil Products Company, and were so issued after due examination as to the novelty, patentability and utility of the inventions therein described and payment of the fees required by law; and that the said Letters Patent granted to the plaintiff, the Universal Oil Products Company, its legal representatives or assigns for the full term of seventeen years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

11. That on and prior to the 25th day of November, 1919, Robert T. Pollock, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of a certain new and useful Process for Converting Hydrocarbons not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof or more than two years prior to his application for Letters Patent therefor and no application for any foreign patent having been filed more than twelve months prior to the filing of the application for Letters Patent in this country and which improvements had not been in public use or on sale in the United States for more than two years prior to his said application for Letters Patent therefor which issued into Letters Patent 1,602,990 and not abandoned to the public.

12. That on the 25th day of November, 1919, the said Robert T. Pollock made and filed an application in writing to the Commissioner of Patents for the grant of Letters Patent in the United States upon the said invention or discovery of Process for Converting Hydrocarbons, said application being Serial No. 339,782, that the invention of said application and any Letters Patent to be issued thereon were duly assigned to plaintiff, the Universal Oil Products Company; that on the 12th day of October, 1926, all of the requirements of the statutes of the United States then in force and the rules of the Patent Office of the United States then in force having been complied with, Letters Patent of the United States No. 1,602,990 for Process for Converting Hydrocarbons were duly issued on the said application to plaintiff, Universal Oil Products Company as assignee of the inventor, Robert T. Pollock; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United States Patent Office signed by the Commissioner of Patents, duly recorded and delivered to the plaintiff, the Universal Oil Products Company, and were so issued after due examination as to the novelty, patentability and utility of the inventions therein described and payment of the fees required by law; and that the said Letters Patent granted to the plaintiff, the Universal Oil Products Company, its legal representatives or assigns for the full term of seventeen years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

13. That on and prior to the 15th day of April, 1925, C. P. Dubbs, then a citizen of the United States, was, within the meaning of the statutes of the United States then in force, the first, sole, true and original inventor of a certain new and useful Method for Treating Hydrocarbon Oils not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof or more than two years prior to his application for Letters Patent therefor and no application for any foreign patent having been filed more than twelve months prior to the filing of the application for Letters Patent in this country and which improvements had not been in public use or on sale in the United States for more than two years prior to his said application for Letters Patent therefor which issued into Letters Patent 1,686,654 and not abandoned to the public.

14. That on the 15th day of April, 1925, the said C. P. Dubbs made and filed an application in writing to the Commissioner of Patents for the grant of Letters Patent in the United States upon the said invention or discovery of Method for Treating Hydrocarbon Oils, said application being serial number 23,389, that the invention of said application and any Letters Patent to be issued thereon were duly assigned to plaintiff, the Universal Oil Products Company; that on the 9th day of October, 1928, all of the requirements of the statutes of the United States then in force and the rules of the Patent Office of the United States then in force having been complied with, Letters Patent of the United States No. 1,686,654 for Method of Treating Hydrocarbon Oils were duly issued on the same application to plaintiff, Universal Oil Products Company as assignee of the inventor, C. P. Dubbs; that said Letters Patent were issued in due form of law in the name of the United States of America under the seal of the United States Patent Office signed by the Commissioner of Patents, duly recorded and delivered to the plaintiff, the Universal Oil Products Company, and were so issued after due examination as to the novelty, patentability and utility of the inventions therein described and payment of the fees required by law; and that the said Letters Patent granted to the plaintiff, the Universal Oil Products Company, its legal representatives or assigns for the full term of seventeen years from the date thereof, the full and exclusive right and liberty to make, use and sell the invention set forth, described and claimed therein throughout the United States and territories thereof.

15. That plaintiff has invested and expended large sums of money and has been to great trouble and expense in and about said inventions of each of said Letters Patent for the purpose of practicing the same and introducing the same into use, and making the same profitable to the plaintiff and useful to the public, and that said inventions have been and are now of great benefit and advantage to the plaintiff and the public; and the public has generally acknowledged and acquiesced in the aforesaid rights of the plaintiff and plaintiff believes it will realize large gains and profits therefrom if infringement by these defendants and their confederates shall be prevented.

16. That plaintiff has duly notified the defendants and each of them of their infringement of said Letters Patent, but nevertheless the defendants and each of them have continued and now continue to infringe to their own profits and to the great damage and injury to the plaintiff.

17. That on information and belief said defendants, Winkler-Koch Engineering Company and Root Refining Company, and each of them, well knowing the premises and the rights secured to the plaintiff herein and without the license and permission of the plaintiff, and in violation and infringement of the plaintiff's rights under each of said Letters Patent have severally infringed said Letters Patent and have jointly connived and conspired to infringe and have jointly infringed said Letters Patent and each of them in the treatment of hydrocarbon oils in violation of said Letters Patent of the plaintiff after the issuance of said Letters Patent and within six years before the commencement of this suit, willfully and unlawfully and without the license or consent of the plaintiff and against its will, and for which infringing acts the said defendants jointly and severally have received great gains, royalties and other profits and are now continuing jointly and severally to receive great profits, royalties, gains and other benefits in violation of the plaintiff's rights in the Patents in suit hereon.

And, further, on information and belief, plaintiff alleges that the defendant Winkler-Koch Engineering Company has conspired with the defendant Root Refining Company, to infringe said Letters

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J&L PIPE

Field Performance Proves Quality of J&L Seamless

Exceptional performance of J & L Seamless in the every-day work of the oil regions backs up our claims of its unsurpassed quality and unvarying dependability. These characteristics are the direct result of J & L's ownership-control of every step in manufacture and nearly 80 years' experience in steel making.

Oil and Gas men, after using our Seamless Steel Casing under every operating condition, pass the word along that "there's no better seamless made than J & L."

J&L STEEL

"Our Hat is Off to J&L Seamless"

Read the following story from the oil fields. It was written by Bob Speck, Covington, Okla., store manager, to the Tulsa office of the Frick-Reid Supply Company, J & L Pipe distributors. The story, just as it was received, reads as follows:

"Tell this one to the Grass Root boys.

"On Friday, July 13th, Wirt Franklin Petroleum Corporation finished running a 6,098-foot string of 6⅝" 26-lb. J & L Seamless Casing in their No. 1 Knecht in Sec. 21-18-4w, Logan County, Oklahoma.

"Compiling the statements of the Farm Boss, Mr. Addie Cope, and Harry Franklin, Tool Pusher, we find that in running 230 joints which averaged approximately 26'6" to the joint, there was not a wobble or a bobble from the top to the bottom, not a defective thread, not a joint that did not 'stab' perfectly the first time, and, as a whole, 'the smoothest running casing job we ever saw.'

"The writer timed the crew for about an hour and found they averaged a little better than two joints every five minutes, starting all joints with chain tongs and finishing up with rotary tongs off the cat head on the rotary.

"OUR HAT IS OFF TO J & L SEAMLESS CASING"

Members of the crew on the Wirt Franklin job described in the letter reprinted above.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH PENNSYLVANIA

Empire believes in it!

Ventilation of oil field buildings is more than a convenience. It is made an absolute necessity by the presence of dangerous fumes and gases.

The Empire Company believes in modern ventilation. Four Swartwout Rotary Ball Bearing Ventilators are mounted on the roof of the new compressor station at Mooreland, Texas, shown above. Many other Empire stations are similarly equipped.

Plan to put Swartwout Ventilators on *your* buildings. Once in place, they require no further attention . . . and assure more efficient ventilation than can be had by any other method.

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Swartwout Ventilators MADE OF ARMCO INGOT IRON

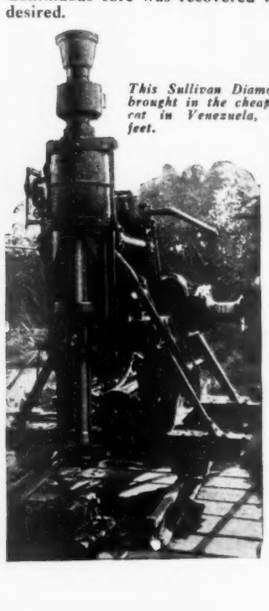
Cheaper Wildcats With Sullivans

20% less for operation—23% less for equipment—
39% less weight to be transported

A major oil company has just completed two wildcats in Venezuela with a Sullivan Diamond Drill.

One hole went to 4,350 feet in five months and nine days. In the other, 4,005 feet of 6⅝-in. casing was set and cemented one month and twenty-six days after spudding in.

Continuous core was recovered wherever desired.



This Sullivan Diamond Drill brought in the cheapest wildcat in Venezuela, at 4,350 feet.

The engineer in charge worked up complete figures on the diamond drill, and on a rotary outfit, for casing a hole to 6,000 feet, and drilling it to 7,000 (diamond drills have taken core from below 6,700 feet).

His figures show that the Sullivan Equipment weighs only 61% and costs only 77% as much as the rotary outfit.

He also says that his experience shows the cost of operation, to run 20% less than for other rigs—due to savings in labor, fuel, water, rigging up, bits, and other items.

For cheaper wildcatting, for deep tests, or for structure exploration use Sullivan Diamond Drills. They will drill any formation as encountered, go to any depth, and furnish perfect core wherever desired. *The coupon will bring complete information.*

Use this Coupon

Send me free literature on diamond drilling.

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Address_____
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_____City_____
I am interested in ☐ Wildcatting ☐ Structure testing ☐ Deep tests.

Sullivan Machinery Company
88 E. Adams St., CHICAGO

Patent and as a part of such conspiracy has designed and made drawings of pipe stills, has furnished other plans and specifications upon which such stills are built, has furnished the parts for such stills, has erected such stills for its confederate Root Refining Company, and has otherwise induced its said confederate to infringe the patents of the plaintiff and each of them and to unlawfully violate the rights of the plaintiff thereunder, and without the privilege or consent of the plaintiff with the full knowledge that said apparatus furnished its confederate, Root Refining Company, is designed and intended to when in operation appropriate the inventions of said Letters Patent and each of them, and for which unlawful acts it has received and is continuing to receive great gains, royalties and other profits.

18. On information and belief plaintiff alleges that the defendant Root Refining Company, has infringed said Letters Patent and each of them by using or causing to be used the inventions of said Letters Patent in the operation of the Winkler-Koch pipe stills operated by the defendant, Root Refining Company and which infringing acts have occurred and are now occurring and that said defendant, Root Refining Company, has furthermore jointly conspired to infringe said Letters Patent and each of them with its confederate Winkler-Koch Engineering Company, by using or causing to be used pipe stills furnished to the defendant, Root Refining Company, by its confederate, Winkler-Koch Engineering Company.

19. That on information and belief, the said defendants and each of them have jointly and severally derived and received and will derive and receive from the aforesaid joint and several infringements, gains, profits and advantages, but to what extent the plaintiff is not informed and cannot therefore set forth; that the plaintiff, by reason of the aforesaid infringement, has been and will be deprived of and prevented from receiving, if such infringement is not restrained by this Court, all of the gains and profits to which the plaintiff is lawfully entitled and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement; that by reason of the aforesaid infringement, the plaintiff has been irreparably injured and has sustained great loss and damage thereby; and unless the infringement is immediately restrained by an order and writ of injunction issuing out of and under the seal of this Court, further irreparable injury, loss and damage will be caused to plaintiff.

20. Wherefore, the plaintiff prays:

(a) That the defendants and each of them be required to make full, true, direct and perfect answer, according to the best of their knowledge, remembrance, information and belief (but not under oath, an answer under oath being hereby expressly waived as to each of said defendants) to all and singular the matters and things hereinbefore charged.

(b) To account for and pay over to your orator, the plaintiff, the profits realized by said defendants and each of them from the unlawful infringement of said Letters Patent in suit and each of them, and also to pay to the plaintiff the damages which the plaintiff has sustained by reason of the said unlawful acts of said defendants and each of them, and that such damages may be increased three-fold, in accordance with the statutes in such cases made and provided and in the judgment of this Honorable Court as may seem reasonable and equitable by reason of the unlawful acts of these defendants and each of them.

(c) And that said defendants and each of them, their officers, agents, servants, workmen and employees of each of them, may be perpetually restrained from further infringement of each said Letters Patent No. 1,378,307, No. 1,484,445, No. 1,534,927, No. 1,537,593, No. 1,602,990 and No. 1,686,654.

(d) That a preliminary injunction restraining said defendants and each of them from further infringement be issued pending this suit.

(e) And that your orator, the plaintiff, may have such further relief as is proper and that the said defendants may be compelled to pay all costs of this suit.

(f) That a subpoena ad respondendum and a writ of injunction issue directly to the said defendants, Winkler-Koch Engineering Company and Root Refining Company.

Oil Companies Act To Prevent Pollution Of City Water Supply

WICHITA, Kans., Mar. 23.—A specially designed pipe line to protect Wichita and the suburban district north of the city against contamination of the Little Arkansas River and water wells will be constructed immediately.

The line, which will be built jointly by the Bu-Vi-Bar Petroleum Corp., the Marland Oil Co. and the Gypsy Oil Co., will dispose of salt water and residue from oil wells in the Wright area.

The line is to be of 6-inch pipe coated inside and outside with Biturine enamel to protect the line from corrosion, and will start on the Byers lease near the NE cor. of Section 7-26-1e, three-quarters of a mile northeast of the Wright and Lyons wells. It will follow a right-of-way south to the north limits of Wichita, where it will connect with the city's sewer system.

Construction of the line will get under way immediately. Fittings and couplings now are on the ground at Valley Center. Most of the pipe either is in transit or being unloaded in the field.

The line will be approximately 33,000 feet long. At the north end it will be connected with various sections of the Wright and Valley Center district, in which the Bu-Vi-Bar, Gypsy and Marland are the dominant operators, by a system of laterals or gathering lines.

A pump station on the Byers lease will force the water through the line to Wichita.

While the project is to be owned jointly by Bu-Vi-Bar, Marland and Gypsy Oil Co., the pipe line department of the latter concern is in charge of construction.

It is estimated the system will cost the oil companies $100,000.

Without such a disposal system it would be almost impossible to prevent salt water and oil getting into the Little Arkansas River and contaminating wells which provide drinking water for thousands of persons in the suburban district between Wichita and Valley Center.

It is probable that other operators in the field will arrange for the disposal of their salt water through the Bu-Vi-Bar, Marland and Gypsy system.

ATLANTIC TO HANDLE WINKLER

HOUSTON, Tex., Mar. 23.—Atlantic Pipe Line Co. (Atlantic Refining Co.) acting as common carrier, has contracted to handle 1,000,000 bbls. of Winkler County crude for Humble Oil & Refining Co., from outside connections previously served by Humble Pipe Line Co. to the Gulf Coast. The oil will be delivered to Humble's tank farm near Spindletop Field at the rate of 7,500 bbls. daily. Atlantic Pipe Line Co. posted tariff on such crude movement is 40 cents a barrel from its Winkler station to Gulf Coast points near its Atreco terminal with field gathering charge of 10 cents a barrel in addition.

CONTINENTAL OIL RUMORS

DENVER, Colo., Mar. 23.—An officer of Continental Oil Co. on his return from the East, said negotiations for acquisition of new properties or merger with another company still were in an indefinite stage and may not be concluded for another month. The merger discussed involves only one company, not named, and not any group of companies as rumored in the East. Col. Robert W. Stewart, formerly of Standard Oil Co. of Indiana, has no connection with the pending deal and if the merger is consummated it will have no effect on the present personnel of Continental.

NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE
Week Ended March 13

Carson County

Ryan Consolidated Oil Co.'s No. 2 B. P. Block, 330 feet south and east of the NW cor. of the NE of Section 111, Block 3, L&G.N.

Gray County

Independent Oil & Gas Co.'s No. 1 A. Hollenbeck, 990 feet south and west of the NE cor. of the NE of Section 176, Block 3, I.&G.N. The Texas Company's No. 1 S. Faulkner, 330 feet south and east of the NW cor. of Section 29, Block B-2, H.&G.N.

Motley County

The Exploration Co.'s No. 5 Matador Land & Cattle Co., at the center of Section 45, Block J-B, G.B.&C.N.G.R.R. Co. Same company's No. 6 Matador Land & Cattle Co., 330 feet south and west of the NE cor. of Section 132, Block M, Matador Cattle Co. Survey.

NORTH CENTRAL AND WEST TEXAS
Week Ended March 13

Andrews County

Mid-Continent Petroleum Corp.'s No. 1 M. M. Fisher, 1,320 feet north and 200 feet east of the SW cor. of Section 5, Block A-36, School Land.

Archer County

L. T. Burns' No. 1 J. H. Turbeville-F, 450 feet south and 150 feet east of the NW cor. of Section 159, R. Carson Survey. Shell Petroleum Corp.'s No. 3 Abercrombie & Taylor-C, 150 feet south and 750 feet west of the NE cor. of the SW of Section 41, Club Ranch Subdivision. Petroleum Producing Co. and others' No. 1 A. M. Kunkle-B, 150 feet north and 338 feet west of the SE cor. of the south 40 acres of the north 80 acres of the NE of Section 3, B.B.B.&C. Lee & Daniels' No. 4 Mrs. G. Williams, 450 feet north and 1,050 feet west of the SE cor. of the south 40 acres of the John I. Hand Survey A-182. C. E. Beavers and others' No. 1 G. M. Benson, 150 feet south and 1,470 feet west of the NE cor. of Section 1828, T.E.&L., being 150 feet south and west of the NE cor. of their 50-acre lease. C. U. Beasley's No. 2 Abercrombie & Taylor, 182 feet north and 750 feet west of the SE cor. of the west 40 acres of the north 80 acres of Section 41, Club Ranch Subdivision. Rathke Oil Co.'s No. 1 Mrs. J. E. Parrish, 150 feet south and west of the NE cor. of the west 30 acres of the north 100 acres of the Mrs. J. E. Parrish 320-acre tract out of Section 2, S.P.R.R., A-1004. C. B. Long's No. 1 Kemp & Kempner, 150 feet north and 1,477 feet west of the SE cor. of Block 67, Kemp Wichita Valley Land. C. B. Long's No. 1 E. S. Taber, 150 feet north and 450 feet west of the SE cor. of Section 9, Mrs. E. Taber Subdivision, Dallas County School Land, A-113.

Brown County

Humble Oil & Refining Co.'s No. 15 A. W. Armstrong, 1,601 feet north and 1,209 feet west of the SE cor. of Section 1, Juan Delgado Survey No. 785. Humble Oil & Refining Co.'s No. 11 Hamp Byler, 150 feet north and west of the SE cor. of their lease out of the T.&N.O. Survey No. 43. Love & Michael's No. 2 Graham Estate, 680 feet north and 150 feet west of the SE cor. of Section 1, J. Brown Survey No. 137. E. T. Green and others' No. 3 L. C. Riordan, 2,235 feet north and 2,950 feet east of the SW cor. of the C. B. Jennings Survey No. 353. George W. McClung's No. 2 Spivey heirs, 975 feet north and 263 feet west of the SE cor. of the NE of Section 22, H.T.&B. United Royalties Co.'s No. 2 T. F. Fitzgerald, 300 feet north and 800 feet west of the SE cor. of the T. F. Fitzgerald 170-acre tract out of the P. Johnson Survey No. 106.

Clay County

Bain & Clark's No. 8 B. Landrum, 1,650 feet north and 450 feet east of the SW cor. of Section 5, Parker County School Land, A-374. Mid-Continent Holding Co.'s No. 3 J. D. Stine and others, 150 feet north and 174 feet east of the SW cor. of Section 7, Parker County School Land, A-374. Texas Development Co.'s No. 1 Boddy, 150 feet south and east of the NW cor. of the E half of Section 65, Angelina County School Land, A-3.

Coleman County

Canyon Oil & Gas Co.'s No. 1 B. D. Wesley, 150 feet south and 1,404 feet west of the NE cor. of Section 6, A. White Survey No. 161. Meredith-Benton & Cameron's No. 1 F. P. Singletary, 696 feet south and 936 feet west of the NE cor. of Section 5, S. B. Mixon Survey No. 628. Vacuum Oil Co. and others' No. 1 L. Weaver-A, 3,500 feet south and 3,775 feet west of the NE cor. of the A. Gable Survey No. 271, being 150 feet north and west of the SE cor. of Lot 10. Jamison-Pollard & Foster and others' No. 1 C. E. Shore (M. T. Overall), 2,810 feet north and 150 feet east of the SW cor. of Section 72, Block 1, G.H.&H. Stepp & Hiete's No. 1 C. E. Shore (M. T. Overall), 900 feet south and 1,110 feet west of the NE cor. of Section 72, Block 1, G.H.&H. Vaughn and others' No. 1 Lee Vaughn, 570 feet north and 750 feet east of the SW cor. of the Bonds & Sanders Survey No. 79. R. V. Whiteside's No. 1 T. T. McCreary, 150 feet north and west of the most southerly SE cor. of the T. T. McCreary 1,150-acre tract out of the J. S. Martin Survey No. 217.

Comanche County

J. F. Carter and others' No. 1 R. H. Reed, 200 feet south and west of the NE cor. of the SE of Section 56, Block 2, H.&T.C.

Crane County

Gulf Production Co.'s No. 61 J. T. McElroy, 2,102 feet south and 3,960 feet east of the NW cor. of Gulf company's lease out of Section 200, Block F, C.C. S.D.&R.G.N.G.R.R. Same company's No. 62 J. T. McElroy, 2,102 feet south and 1,320 feet west of the NE cor. of Gulf company's lease out of Section 201, Block F, C.C.S.D.&R.G.N.G.R.R.

Crockett County

Epeneaur and others' No. 2 W. T. Noelke, 500 feet north and 1,250 feet east of the SE cor. of Section 64, Block 1, I.&G.N., and located in the W. T. Mullins Survey No. 60, A-5174.

Eastland County

Panhandle Refining Co.'s No. 2 C. S. Wheeler, 200 feet south and 650 feet east of the NW cor. of the north 50 acres of the C. S. Wheeler 100-acre tract out of Section 23, McLennan County School Land, League 2. Belva Oil Co.'s No. 7 F. Good, 155 feet north and 600 feet west of the SE cor. of their lease out of the J. R. Stubblefield Survey. L. E. Edwards' No. 1 H. L. Gibson, 150 feet north and 980 feet east of the SW cor. of the NW of Section 24, Block 4, H.&T.C. S. A. Hopkins and others' No. 2 N. H. Jones, 589 feet north and 2,881 feet west of the SE cor. of the N half of Section 43, Block 4, H.&T.C. Texas Pacific Coal & Oil Co.'s No. 5 R. W. and J. M. Higginbotham, 153 feet south and 1,666 feet west of the NE cor. of Section 53, Block 4, H.&T.C.

Haskell County

Superior Oil Corp.'s No. 3 Reynolds Cattle Co., 1,390 feet south and 250 feet east of the NE cor. of the A. Rodriguez Survey A-350, and located in the J. Fenner Survey A-582.

McCulloch County

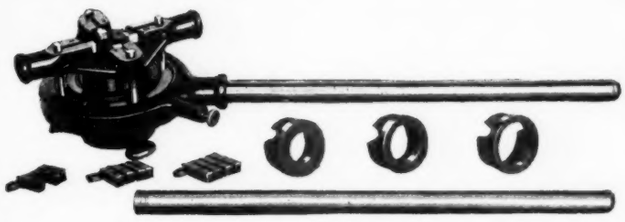
George Hartshell and others' No. 1 Charles Steelhammer, 600 feet south and 900 feet east of the NW cor. of the SW of the State Survey No. 160.

Jack County

Republic Production Co.'s No. 1 Mrs. Mary Bryson, 312 feet north and 330 feet east of the SW cor. of the north 88.5 acres of the Mary Bryson 140-acre tract out of the Isaac Hughson Survey A-256.

Howard County

Comet Oil Co.'s No. 3 H. R. Clay, 200 feet south and east of the NW cor. of Section 154, Block 29, W.&N.W.R.R. Plymouth Oil Co.'s No. 2 Kloh and others, 990 feet south and 1,650 feet west of the NW cor. of Section 5, Block 32,



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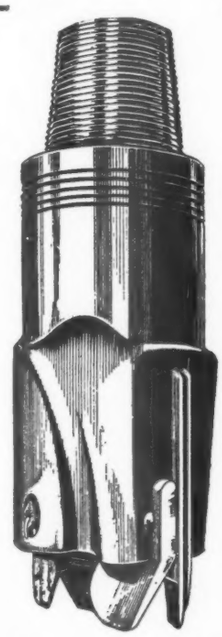

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Jones County

W. D. Wells and others' No. 1 Fred Britton, 150 feet north and 890 feet east of the SW cor. of the F. Britton 640-acre tract out of the Austin & Williams Survey Nos. 354 and 355, and located in Survey No. 355.

Pecos County

Atlantic Oil Producing Co.'s No. 1 J. C. Trees, 330 feet south and 990 feet east of the NW cor. of Section 108, Block 8, H.&G.N. A. R. Bell and others' No. 1 A. A. Gray, 150 feet north and 2,490 feet east of the SW cor. of Section 593, G.C.&S.F., A-3009.

Presidio County

L. C. Brite's No. 2 L. C. Brite, 2,500 feet north and 2,200 feet west of the SE cor. of Section 51, Block 12, G.H.&S.A. Survey.

Reagan County

Kemrow Co.'s No. 1 Sawyer Cattle Co., 1,320 feet south and 1,980 feet west of the NE cor. of the J. G. Robinson Survey No. 8, Block A.

Runnels County

Huff Oil Co.'s No. 1 C. O. Furgason, 1,320 feet south and west of the NE cor. of the W half of Section 152, W.C.R.R. Survey.

Shackelford County

George Callahan's No. 1 J. H. Nail, Section 151, 150 feet south and west of the NE cor. of the S half of the SW of Section 151, Block 10, E.T.R.R. Survey. Earl & Dull's No. 6 J. B. Matthews, 750 feet south and 450 feet west of the NE cor. of the SE of the NE of Section 32, Block 10, E.T.R.R. Survey. Grisham-Hunter Corp.'s No. 2 W. Y. and R. A. Davis, 150 feet north and west of the SE cor. of the W half of the SE of Section 17, Block 13, T.&P. Survey. Loggie & Arndt's No. 1 J. B. Matthews, 450 feet south and 2,372 feet east of the NW cor. of Section 1, Block 10, E.T.R.R. Survey. Mid-West Exploration Co.'s No. 4 J. F. Dyer, 950 feet south and 190 feet west of the NE cor. of Section 85, Block 12, T.&P. Survey. W. A. Moncrief and others' No. 1 A. A. Gustafason, 150 feet north and west of the SE cor. of the NW of the NW of Section 169, B.B.B.&C. Survey. Ohio-Texas Oil Co.'s No. 1 J. B. Matthews-C, 150 feet south and west of the NE cor. of the NW of the SW of Section 29, Block 10, E.T.R.R. Survey. Roeser & Pendleton's No. 88 W. I. Cook-A, Section 60, 1,900 feet south and 450 feet east of the NW cor. of the SW of Section 60, Block 10, E.T.R.R. Survey. Same company's No. 11 W. I. Cook-A, Sec. 83, 470 feet south and 1,445 feet west of the NE cor. of the SE of Section 83, Block 10, E.T.R.R. Survey. Same company's No. 2 W. I. Cook-A, Section 88, 2,461 feet south and 1,950 feet east of the NW cor. of Section 88, Block 10, E.T.R.R. Survey. H. Shulman and others' No. 1 J. B. Matthews, 150 feet north and 500 feet west of the SE cor. of the SW of Section 57, Block 10, E.T.R.R. Survey.

Stephens County

Texas Consolidated Oil Co.'s No. 1 J. C. Curry, 500 feet south and 300 feet west of the NE cor. of the SW of Section 25, Lunatic Asylum Land.

Sterling County

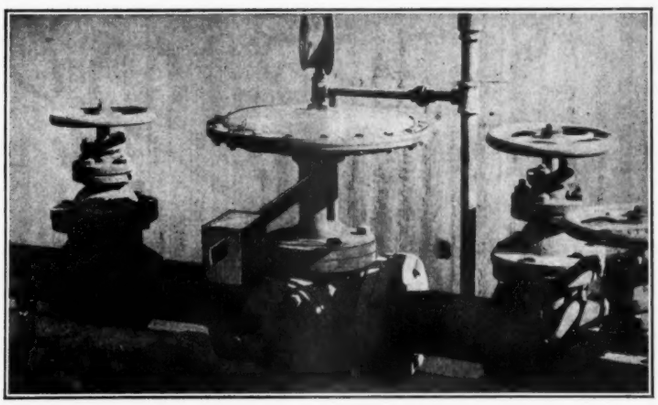
George L. Miller's No. 1 W. L. Foster, 900 feet south and 1,397 feet west of the NW cor. of Section 30, Block 23, H.& T.C., being 3,691 feet south and 1,397 feet west of the NE cor. of Section 4, Block 31, T-4-S, T.&P.

Throckmorton County

W. W. Donnelly and others' No. 1 Reynolds Cattle Co., at the center of the SW of the SE Section 22, A.B.&M. Survey, Block 2.

Wichita County

R. R. Robertson's No. 1 J. L. Waggoner and others, 150 feet north and 150 feet east of the most southerly SW cor. of Lot 3, M. A. Willis, Survey A-548. E. J. Stump & Co.'s No. 1 J. F. Boyd, 150 feet south and 450 feet west of the NE cor. of Lot 12, J. T. Lewis Survey A-462. G. H. Howell's No. 1 Foster & Allen, 3,532.5 feet north and 150 feet east of the SW cor. of Section 1, H.T.&B.



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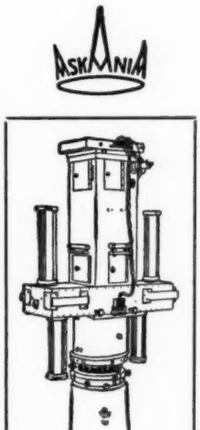

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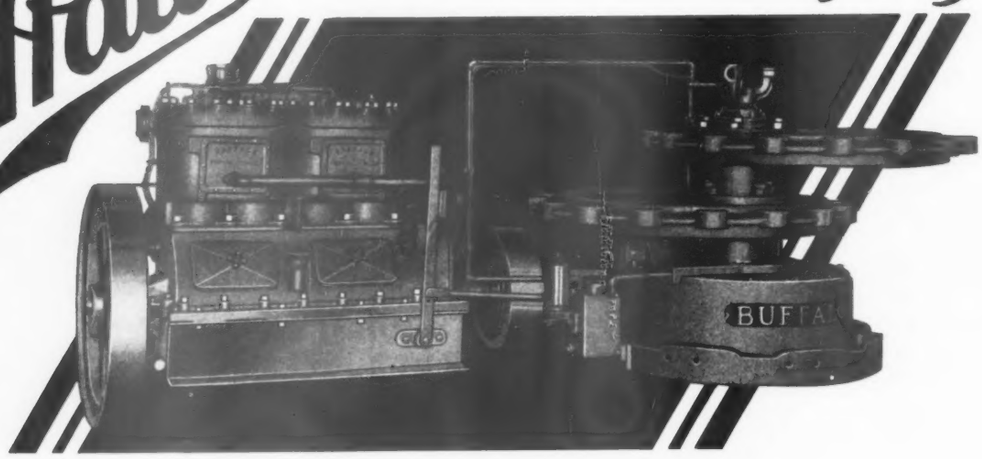

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The proven dependability of the installation; elimination of replacement, time and power losses such as are found in use of the band wheel type of power; low installation cost:—all these factors combine to make the BUFFALO Oil Well Pumping Power by far the most economical obtainable.

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Survey A-129. L. P. Hammond's No. 1 H. A. Overall, 150 feet south and 1,035.6 feet west of the NE cor. of the D.L.&C. Co. Survey A-711. John W. Caldwell's No. 13 Allen & Kemp, 750 feet south and 150 feet east of the NW cor. of the S half of Lot 10, Block 26, Kemp Wichita Valley Land.

Winkler County

Atlantic Oil Producing Co.'s No. 5 Ida Hendricks, 1,320 feet south and 2,310 feet west of the NE cor. of Section 44, Block 26, School Land. Humble Oil & Refining Co.'s No. 10 T. G. Hendricks-C, Lease 2, 2,200 feet south and 330 feet east of the NW cor. of Section 10, Block B-12, School Land. Prairie Oil & Gas Co.'s No. 2 Lum Daugherty, 330 feet south and 990 feet east of the NW cor. of Section 16, Block 74, School Land. Southern Crude Oil Purchasing Co.'s No. 7 T. G. Hendricks T-89-J, 1,540 feet south and 1,320 feet west of the NE cor. of Section 9, Block B-12, School Land.

Young County

L. G. Bradstreet Co.'s No. 6 L. A. Snider, 150 feet south and 510 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 7 L. A. Snider, 1,050 feet south and 150 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Brashear & Peacock's No. 1 W. W. Gregg, 150 feet north and 1,020 feet east of the SW cor. of Section 17, Young County School Land, A-1,284. J. C. Cunningham's No. 1 J. C. C. Edwards, 150 feet south and west of the NE cor. of the south 20 acres of the north 80 acres of the J. C. C. Edwards 100-acre tract out of the S. Tynes Survey A-274. Pennell and others' No. 2 R. J. Calvin, 450 feet south and 150 feet west of the NE cor. of the north 25 acres of the east 50 acres of the R. J. Calvin 200-acre tract out of the A. Rohus Survey A-240. Robertson Drilling Co.'s No. 2 F. M. Gillmore, 450 feet south and 1,020 feet east of the NW cor. of Section 14, Young County School Land, A-1,284. W. R. Stafford and others' No. 1 G. T. Melton, 150 feet north and west of the SE cor. of the north 28 acres of the G. T. Melton 68-acre tract out of the S. Tynes Survey A-274. Steed & Gaus No. 5 L. A. Snider, 2,000 feet south and 1,740 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 6 L. A. Snider, 1,400 feet south and 1,740 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 7 L. A. Snider, 1,140 feet south and 1,970 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 8 L. A. Snider, 1,000 feet south and 2,220 feet east of the NW cor. of the Robert Wilson Survey A-1,276.

Steed & Gaus No. 9 Snider, 150 feet south and 1,470 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 10 L. A. Snider, 150 feet south and 1,770 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 11 L. A. Snider, 1,140 feet south and 2,470 feet east of the NW cor. of the Robert Wilson Survey A-1,276. Same company's No. 12 L. A. Snider, 450 feet south and 810 feet east of the NW cor. of the Robert Wilson Survey A-1,276. E. W. Walton and others' No. 3 E. R. Prideaux, 150 feet north and west of the SE cor. of the north 37 acres of the west 80 acres of the E. R. Prideaux 126-acre tract out of the S. Tynes Survey A-274. C. C. Williams' No. 3 M. H. Bagley, 150 feet southeast of the NW line and 600 feet northeast of the southwest line of the M. H. Bagley 80-acre tract out of the P. Averett Survey A-2. Wise & Jackson's No. 6 R. J. Calvin, 450 feet south and 850 feet east of the NW cor. of the R. J. Calvin 200-acre tract out of the A. Rohus Survey A-240. Wo-Mac Oil Co.'s No. 8 G. Stewart, 550 feet south and 950 feet west of the NE cor. of their 40-acre lease out of the D. Dawson Survey A-76. Wootten & Reed's No. 1 D. G. Vick, 1,341 feet north and 150 feet east of the SW cor. of the P. R. Splane Survey A-259. Nash & Windfohr's No. 3 John Ware-A, 150 feet south and 300 feet east of the SW cor. of the J. W. Manning Survey A-188 and located in the Paul Pier Survey A-219. Scott & Nance's No. 1 W. M. Goode, 600 feet south and 150 feet west of the NE cor. of the J. M. Rice Survey

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A-247. Stivers & Streeter's No. 1 A. S. Lobban, 500 feet north and west of the SE cor. of Section 1,667, T.E.&L. Survey. E. C. Stovall's No. 12 E. C. Stovall, 200 feet south and west of the NE cor. of Lot 17, E. C. Stovall Subdivision, James Tobin Survey A-279.

CENTRAL WEST FIELDS

(Continued from Page 64)

in No. 1-3,430 on the C. M. Palmer farm, Section 6, Hanover Township.

In Medina County, Medina Township, the Ohio Fuel Gas Co. drilled in a fairly good gas well in No. 1-3,396 on the John Kenzig farm, Section 9. East Ohio Gas Co.'s No. 1 on the J. and A. Jelenis farm, Lot 2, is reported good for 5 bbls from the shallow sand. Logan Gas Co. is drilling No. 2-3,063 on the A. J. House farm, Section 6, Lafayette Township.

In Wayne County, Congress Township, Harmon and George found a dry hole on the Doctor Diddle farm, Section 7. Ohio Fuel Gas Co. is drilling No. 1-3,423 on the Earl E. Weaver farm, Section 7, Chester Township.

In Holmes County, Paint Township, the Ohio Fuel Gas Co. drilled a dry hole in No. 1-3,379 on the Joseph P. Miller farm, Lot 4. William Detler drilled a dry hole on the John V. Dahl farm, Section 30, Knox Township, at a depth from 812 to 823 feet. East Ohio Gas Co. is drilling on the A. T. Kilgore farm, Section 5, Salt Creek Township, also drilling No. 3 on the H. C. Roby, Section 14, Richland Township.

In Richland County, the Ohio Fuel Gas Co. made a location for No. 1-3,492 on the Phoebe Herring farm, Section 33, Monroe Township.

In Knox County, Brown Township, the Upham Gas Co. is starting No. 6 on the R. J. Kunkle farm, Section 6, where a good gas well was recently brought in. Ohio Fuel Gas Co. is starting the drill at No. 1-3,469 on the J. A. Reed farm, Section 11. East Ohio Gas Co. made a location on the H. W. Galehouse farm, Section 20, Jefferson Township. Harry Perkins is drilling No. 1 William Durbin farm, Section 15, Howard Township.

In Coshocton County, Pike Township, the Leonard Oil & Gas Co. made a location on the Levi Norris farm, Section 19.

In Summit County, Franklin Township, the East Ohio Gas Co. made a location on the A. F. Smith, Section 25. Same company is drilling on the F. H. Mason farm, Section 14, same township.

In Licking County, Hulse & Kundtz's No. 7 on the John Chaney farm, Section 1, Perry Township, is reported with an initial production of 120 bbls. in the Clinton lime at from 2,848 to 2,893 feet, along with close around 250,000 feet of gas. H. C. Farmer's No. 4 on the David Wright farm, Section 16, produced 12 bbls. at from 749 to 761 feet, being the Berea formation.

In Muskingum County, the Pure Oil Co.'s No. 5 George Crawford farm, Section 5, Jackson Township, produced an initial of 80 bbls. in the Clinton lime from 2,857 to 2,901 feet. Same company is drilling No. 1 Otis McKee farm, Section 5, same township. William Kline and others are drilling on the Ray Stine farm, Section 11, Clay Township, and the Hope Construction & Refining Co. struck a 20-bbl. initial producer at a second test on the Almeda Butler farm, Licking Township. William Kline and others are also drilling No. 5 on the Theodore and Guy Combs farm, Section 2, Clay Township.

In Athens County, Berne Township, the Ohio Fuel Gas Co. has a light gas well in No. 1-3,440 on the E. J. Elliott farm, Section 35. The gas was found in the lower Berea sand at from 1,601 to 1,618 feet and drilled to 1,624 feet. Same company is drilling No. 2-3,457 on the John B. Elliott farm, same section. Same company abandoned No. 1-3,340 on the George King, Section 7, Lodi Township, at 1,550 feet, the Berea formation. Same company is drilling No. 2-3,476 on the T. R. Phillips, in fractional Section 12, same township.

In Meigs County, the Preston Oil Co. made a location for No. 3-1,300 on the Emma Williams farm, Section 24, Sut-

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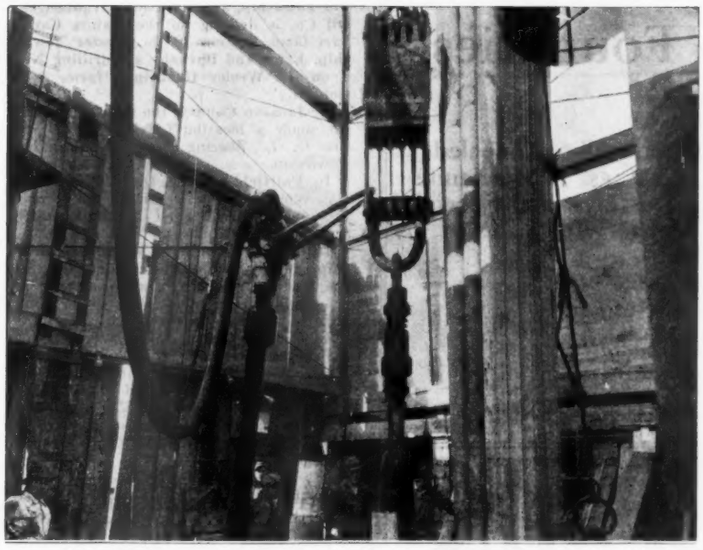
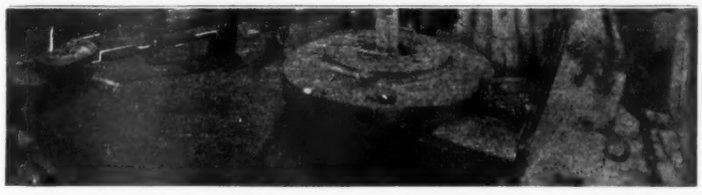


To Avoid Trouble in Rotary Drilling



The best way to avoid trouble in your rotary drilling is to equip your rig with a hose especially built to support couplings, to withstand twisting, to hold pressure unfailingly, and to resist severely abrasive wear.

Goodyear Rotary Hose is built to meet such service requirements; it has the sure strength so essential to trouble-free, economical rotary drilling.

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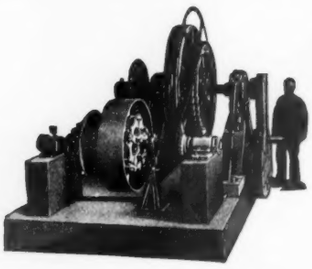

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ton Township, and the Pennsylvania Grit Oil Co. is drilling on the Hanna Capehart farm, Section 30. In Chester Township, Frick and Barnaby are drilling No. 4 on the Wesley Genheimer farm, Section 21.

In Jackson County, the Ohio Fuel Gas Co. made a location for No. 2-3,487 on the D. L. Zearing farm, in Franklin Township.

In Fairfield County, the City Natural Gas Works made a location for a second test on the E. E. and Nettie Linscott farm, Section 35, Berne Township.

In Guernsey County, Cambridge Township, Jewell and others' second test on the Isaac J. Oldham farm, Section 4, is reported to have made close to 35 bbls. naturally at 3,380 feet.

In Morgan County, Marion Township, a light gas well was drilled in by J. H. McBride on the Marion Mills farm, Section 25. The gas was found in the lower Berea at from 1,536 to 1,556 feet. Ohio Fuel Gas Co. made a location for No. 1-2,763 on the Hugh Ellis farm, Lot 4, same township.

Growth in Tankers And Vessels With Diesel Type Power

By A. E. Mockler

NEW YORK, Mar. 23.—A steady increase in the world's tonnage of tankers and motorships, with a marked trend toward the latter, is disclosed by the annual report of Lloyds, Ltd. Tankers afloat now show the huge aggregate tonnage of 6,620,028 gross tons, a gain from 5,915,677 tons, and comparing with 1,478,988 tons afloat in July, 1914. There has been a pronounced tendency toward Diesel-poewered vessels in all classes of construction, with new motorships numbering 160 of 812,437 gross tons, of which 150 of 811,983 gross tons have engines consuming heavy oil. The total motorship tonnage comprised 685 vessels and 3,438,933 tons.

The largest tanker afloat is the motor vessel "C. O. Stillman" of 16,436 gross tons, owned by the International Petroleum Co. Other large tankers receiving Lloyd's classification included the motor vessel "Victolite" of 11,410 tons, owned by the Imperial Oil Co., Ltd.; motor vessel "Vancolite" of 11,404 tons, owned by the same company; motor vessel "Gulfbird" of 10,208 tons, owned by the Gulf Refining Co., and the steamer "Gretafield" of 10,191 tons, owned by the Northern Petroleum Tank Steamship Co., Ltd.

The total number of ships of all types of construction, intended for carrying oil in bulk (not including those of less than 1,000 tons) built under Llyod's inspection during the past year amounted to 102 of 587,491 tons gross.

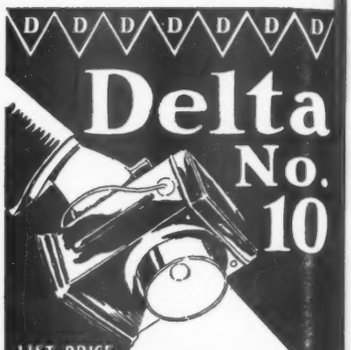
There is a consistent increase in demand for oil carrying vessels, due to the increasingly widespread ramifications of the world oil industry. There were 91 vessels of all classes, with 431,391 gross tons, or 40.6 per cent of the total tonnage of new steamers classed during the year, which were fitted for burning fuel oil. The increase in the gross tonnage of vessels equipped, either originally or through conversion, for burning fuel oil, is shown by the following comparison: July, 1914, 1,310,209 gross tons; July, 1927, 18,481,759 gross tons; July, 1928, 19,053,014 gross tons. These figures do not necessarily indicate that all of the vessels so classed are using fuel oil. In many installations, coal burning and oil-burning equipment is interchangeable, so that the ship owners may take advantage of low markets on either fuel.

Lloyd's report disclosed that the principal feature of the shipbuilding program has been the greater use of the internal combustion engine as means of marine propulsion. The report of Lloyd's last year stressed the continued demand for double-acting Diesel engines. The current report sets forth that there are now being constructed 17 sets of this type, of approximately 180,000 indicated horsepower.

Trend Illustrated

The definite trend toward internal-combustion engines is illustrated by the

Delta No. 10



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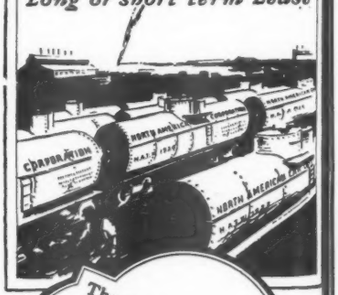

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following data from the Lloyd report, including all motorships of 100 tons and over:

Motorships, Including Auxiliary Vessels	No.	Gross tons
July, 1914	297	234,287
July, 1927	2,552	4,270,824
July, 1928	2,933	5,432,302

Of the 2,933 motor vessels listed for the current year, 338 are of 6,000 tons and over. Of this latter total, 204 have tonnage ranging from 6,000 to 7,999 tons, 95 are from 8,000 to 9,999 tons, 25 range from 10,000 to 14,999 tons, and 14 are of 15,000 tons and upwards.

The report declares that a noteworthy feature of further developments in the diesel-electric drive is illustrated by the oil tanker "Brunswick," built for the Atlantic Refining Co. by Scotts' Shipbuilding & Engineering Co., Ltd. The propulsive machinery of this tanker consists of four Diesel engines driving four main electric generators supplying current to one double unit main propelling motor.

Several years ago officials of the United States Shipping Board came to the conclusion that European maritime nations were rapidly outstripping the American merchant marine because they were turning out fast, modern motorships, capable of fast service, and extremely economical in operation, particularly on long-haul voyages. The Diesel engine is an European development. To encourage the building of diesel marine engines in the United States, the Shipping Board asked and received from Congress an appropriation of $25,000,000 to be expended in modernizing part of its fleet by converting vessels from steam to Diesel drive.

Twelve vessels of the Emergency Fleet Corp. fleet were selected as the first group, and about $10,000,000 spent in converting them to Diesel drive. These vessels are now in operation. Eight more vessels of the Shipping Board fleet were recently selected for conversion, and their engines are now under construction.

In addition to the 12 motorships now in operation, and the 8 undergoing conversion, the Shipping Board has nearing completion three more motorships, the Triumph, Defiance and Courageous. These latter three are Diesel-electric drive, a departure from direct Diesel drive. These 23 vessels will represent an expenditure of $20,000,000 and it is expected that the remaining $5,000,000 of the board's appropriation will be used in modernizing several other vessels through conversion to Diesel drive.

Diesel Tankers

Many of the large American oil companies have swung over to the Diesel idea and most of the larger tankers which have been constructed during the past year have this type propulsion. It is reported from the marine departments of the various companies that operation of their Diesel-powered tankers has been more economical and more generally satisfactory in all ways to the older type of vessel.

With the marked trend toward Diesel propulsion in maritime circles, it is but natural that consumption of Diesel oil should show a corresponding gain. While definite statistics regarding Diesel oil consumption are lacking, it is estimated that marine consumption of this oil during the coming year will show increases ranging from 25 to 50 per cent over the 1928 figures, and that consumption figures will continue to grow proportionately for several years to come, owing to the extremely important place which Diesel-electric drive is occupying in the world shipbuilding program. British maritime concerns, as well as those of the Scandinavian countries, have been largely swinging over to Diesel and considerable new construction involving this type propulsion is now under way in these countries.

ALBERT HILL'S DEATH

Albert Hill, treasurer of the Atlantic Refining Co., Philadelphia, Pa., died in that city recently. The burial was held March 13 and as a mark of respect to the deceased all the offices of the company and its subsidiaries were closed during the hour of the funeral services.

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Tulsa, Okla.

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS
Pipe Line Statement for January

Runs

Company—	Month (bbls.)	Dly av. (bbls.)
Prairie P. L. Co.*	4,743,000	153,000
Gulf P. L. Co.	1,297,206	41,845
Texas P. L. Co.	1,117,612	36,052
Magnolia P. L. Co.	2,214,105	71,423
Empire P. L. Co.	1,574,458	50,789
Cosden P. L. Co.	930,392	30,013
Sinclair P. L. Co.	3,527,490	113,790
Oklahoma P. L. Co.	3,489,691	112,570
Other lines*	6,386,000	206,000
Total January	25,279,954	815,482
Total December	25,415,487	819,853
Difference	135,533	4,371

Shipments

Prairie P. L. Co.†	5,914,555	190,792
Gulf P. L. Co.	1,659,830	53,543
Texas P. L. Co.	1,119,561	36,115
Magnolia Pet. Co.	2,139,066	69,002
Empire P. L. Co.	1,385,602	44,697
Cosden P. L. Co.	867,996	28,000
Sinclair P. L. Co.†	3,232,513	104,275
Oklahoma P. L. Co.	3,479,773	112,251
Other lines*	6,448,000	208,000
Total January	26,246,896	846,675
Total December	26,406,200	851,814
Difference	159,304	5,139

Stocks

Prairie O. & G. Co.*	35,044,000
Gulf P. L. and Gypsy Oil Cos.	9,504,353
The Texas Company	8,189,858
Magnolia Pet. Co.	9,548,097
Empire P. L. Co.	4,295,709
Mid-Continent Pet. Corp.	3,687,321
Sinclair Crude Oil Pur. Co.*	20,709,000
Carter Oil Co.	12,428,302
Oklahoma P. L. Co.	3,176,409
Other lines*	11,700,000
Total January	118,283,049
Total December	116,940,815
Difference	1,342,234

*Estimated. †Prairie Pipe Line and Sinclair Pipe Line shipments include Texas crude oil.

Note—Stocks do not include approximately 7,700,000 bbls. of crude oil held in storage on private tank farms and leases.

EASTERN PIPE LINE REPORT

Runs from Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for January and February:

	Jan., 1929	Feb., 1929
Nat. Transit	136,672.42	133,165.29
S. W. Pa. P. L.	99,615.87	88,660.70
Eureka P. L.	352,729.30	308,956.88
Buckeye P. L. (Macksburg)	330,659.13	298,720.83
Buckeye P. L. (Cleveland)	11,137.67	10,466.65
Buckeye P. L. (Lima, etc.)	90,382.06	81,725.70
Indiana P. L.	4,133.22	3,645.21
Cumberland P. L.	195,655.99	173,139.79
N. Y. Transit	26,987.20	25,714.25
Tidewater P. L.	201,809.34	188,664.86
Pure Oil	63,975.76	55,790.43
Emery P. L.	64,263.32	59,159.57
Paragon Dev.	17,882.64	16,717.79
Stoll Oil	8,337.71	6,833.00
Total	1,604,241.63	1,451,334.95
Daily average	51,749.73	51,833.39

Note—Indian Refining Co. also reported other receipts of 276,018.71 bbls. Paragon Refining Co. had other receipts of 153,894.94 bbls. Paragon Development had other receipts of 372.84 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, and Kentucky for January and February:

	Jan., 1929	Feb., 1929
Nat. Transit	572,124.61	385,191.81
S. W. Pa. P. L.	438,318.41	334,454.56
Eureka P. L.	223,981.34	203,870.95
Buckeye P. L. (Macksburg)	193,196.90	161,417.11
Buckeye P. L. (Cleveland)	2,667.94	1,932.85
Buckeye P. L. (Lima, etc.)	1,292,954.24	1,100,029.84
Indiana P. L.	1,426,599.14	1,288,564.76
Cumberland P. L.	175,926.75	129,595.90
Southern P. L.		78,401.44
N. Y. Transit	188,973.27	133,227.78
Northern P. L.	131,681.47	154,522.76
Tidewater P. L.	164,335.93	191,990.86
Pure Oil	60,320.01	58,985.39
Emery P. L.	58,403.16	69,672.20
Paragon Ref.	188,656.77	153,894.94
Paragon Dev.	19,225.73	17,084.90
Total	5,137,359.67	4,462,838.05
Daily average	165,721.28	159,387.06

Note—Indian Refining Co. reported other deliveries of 291,227.63 bbls.

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of January and February:

	Jan., 1929	Feb., 1929
Nat. Transit	812,449.58	779,918.51
S. W. Pa. P. L.	495,706.51	473,848.71
Eureka P. L.	1,186,389.33	1,154,081.70
Buckeye P. L. (Macksburg)	539,030.90	533,780.16
Buckeye P. L. (Cleveland)	58,406.82	39,875.08
Buckeye P. L. (Lima, etc.)	2,223,198.38	2,114,370.56
Indiana P. L.	520,629.71	521,024.63
Cumberland P. L.	527,107.30	573,102.52
Southern P. L.	531,254.68	446,321.17
N. Y. Transit	265,636.20	286,204.16
Northern P. L.	389,493.68	401,642.64
Tidewater P. L.		1,303,959.46
Pure Oil	16,499.34	14,136.77
Emery P. L.	19,132.04	8,672.52
Paragon Ref.	21,287.75	21,124.63
Indian Ref.	74,153.69	60,203.15
Paragon Dev.	6,187.72	6,568.59
Total	7,596,563.63	8,738,834.96
Increase	57,008.46	1,142,271.33

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern pipe lines at the close of January and February showing the gross stocks of the above fields:

	Jan., 1929	Feb., 1929
Pennsylvania	2,988,208.30	3,246,721.38
Lima	696,840.58	659,187.62
Kentucky	755,304.30	747,383.60
Mid-Continent	3,070,290.16	3,810,386.65
Illinois	85,920.29	275,155.71
Total	7,596,563.63	8,738,834.96

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1926	1927	1928	1929
January	55,630	56,209	52,904	51,749
February	60,394	61,298	57,002	51,833
March	61,644	63,247	57,485	.....
April	63,019	60,927	56,812	.....
May	60,580	60,284	62,067	.....
June	61,121	62,757	58,230	.....
July	63,206	58,674	57,144	.....
August	61,815	60,870	57,745	.....
September	64,639	60,285	53,487	.....
October	161,132	147,080	58,100	.....
November	67,774	57,275	53,565	.....
December	58,755	53,089	52,025	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1926	1927	1928	1929
January	156,056	141,227	146,465	165,721
February	159,488	138,534	167,368	159,387
March	150,239	133,777	158,883	.....
April	152,374	140,227	172,935	.....
May	160,998	144,594	180,559	.....
June	160,257	149,772	188,024	.....
July	160,045	151,850	189,470	.....
August	151,929	188,653	192,853	.....
September	158,915	144,213	194,138	.....
October	161,132	147,036	176,000	.....
November	172,608	150,975	176,898	.....
December	136,428	144,504	173,572	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1927	1928	1929
January	9,718,008	12,276,710	7,596,564
February	10,119,162	12,180,419	8,738,835
March	10,794,044	12,239,725	.....
April	11,112,295	11,740,125	.....
May	11,359,381	11,602,468	.....
June	11,493,673	11,287,678	.....
July	11,458,128	10,819,331	.....
August	11,989,115	10,236,743	.....
September	12,212,716	9,660,910	.....
October	12,047,661	9,229,709	.....
November	11,939,740	8,366,553	.....
December	12,340,297	7,539,555	.....

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line Co. at the close of business for the months named and not counted in the stocks and averages reported above:

	Runs	Shipments	Stocks
1928—			
February	2,460.14	3,109.34	21,170.79
March	2,578.86	3,540.33	20,209.32
June	3,153.08	2,779.02	17,922.58
July	2,902.50	3,628.02	17,197.06
August	2,874.11	2,350.13	17,721.04
September	2,820.31	5,255.42	15,285.83
October	1,289.93	538.89	17,551.93
November	2,663.53	788.47	19,426.99
December	3,053.60	3,167.53	19,426.99
1929—			
January	2,099.90	.....	19,313.06

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, March 1	2,312,433.71
Runs from wells	494,767.30
Other receipts	305,630.41
Regular deliveries	460,858.05
Other deliveries	330,189.62

The amount of Illinois oil run by the Tidewater Pipe Line Co. in February was 22,562.87 bbls. Deliveries were 42,524.65 bbls. Adding these figures to those of the Illinoise Pipe Line Co. makes the runs and deliveries as follows:

	Runs	Deliveries
1928—		
March	725,250.82	520,595.69
April	526,013.13	448,282.44
May	632,968.64	522,980.51
June	608,552.49	625,087.33
July	612,286.49	565,678.37
August	639,074.85	671,864.02
September	570,307.91	737,293.56
October	626,147.64	626,290.40
November	576,332.88	702,589.93
December	584,633.00	491,517.26
1929—		
January	570,727.38	545,084.66
February	517,330.17	503,387.76

Tidewater Pipe Co., Ltd., also delivered in February, 132,675.31 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans Port Arthur Baton Rouge Sabine Pass	Tampa	Total	Total all ports
September	11,100		18,967	38,200	6,700	74,967	.....	.....	.....	.....	74,967
October	17,323	....	11,807	6,483	..	.....	.....	.....	.....	.....	35,613
November	21,333	5,200	25,400	18,200	7,100	77,233	..	..	....	1,000	78,233
December	4,968	2,968	24,678	18,806	3,064	54,484	..	....	....	2,419	56,903
January	15,838	.....	16,676	11,838	7,938	52,290	..	....	.....	5,161	57,451
February	14,214	.....	38,750	17,250	11,607	81,821	.....	....	.....	3,750	85,571

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans Port Arthur Baton Rouge	Sabine Pass	Tampa	Total	Total all ports
September	22,933	19,100	110,467	30,700	14,333	197,533	6,367	41,300	6,333	1,667	55,667	253,200
October	20,161	16,839	128,452	27,710	7,098	200,258	....	32,226	3,065	1,612	36,903	237,161
November	18,400	16,033	133,700	30,267	8,433	206,833	1,333	37,167	4,633	....	43,133	249,966
December	15,419	15,968	140,871	42,323	8,709	223,290	2,903	35,129	2,355	....	40,387	263,677
January	11,936	8,903	130,065	34,871	15,709	201,484	.....	34,808	4,098	1,287	40,193	241,677
February	13,750	15,071	135,179	32,750	17,893	214,643	.....	34,257	821	143	35,321	249,964

GROSS PRODUCTION IN UNITED STATES FOR 12 MONTHS (Revised)

(In barrels of 42 gallons)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
1928—										
February:	Month	18,038,459	19,294,426	19,678,396	3,079,887	2,571,575	1,734,207	2,230,887	3,166,000	69,793,837
	Daily average	622,016	665,324	678,565	106,203	88,675	59,800	76,927	109,172	2,406,684
March:	Month	19,118,324	20,162,524	21,542,865	3,379,031	2,687,948	1,866,106	2,401,911	3,522,000	74,680,709
	Daily average	616,720	650,404	694,931	109,001	86,708	60,197	77,481	113,613	2,409,055
April:	Month	18,280,729	19,096,920	21,876,913	3,412,260	2,472,600	1,912,187	2,370,810	3,231,000	72,653,419
	Daily average	609,357	636,564	729,230	113,742	82,420	63,740	79,027	107,700	2,421,780
May:	Month	19,331,866	19,443,355	21,220,046	3,367,809	2,843,847	1,926,026	2,525,043	3,619,000	74,276,992
	Daily average	623,609	627,205	684,518	108,639	91,737	62,130	81,447	116,742	2,396,032
June:	Month	19,164,244	18,482,981	19,877,936	3,202,050	3,075,911	2,074,422	2,425,470	3,401,000	71,704,014
	Daily average	638,808	616,099	662,598	106,735	102,530	69,147	80,849	113,367	2,390,134
July:	Month	19,754,458	18,809,188	22,055,737	3,171,548	2,792,139	2,238,090	2,492,586	3,487,000	74,800,746
	Daily average	637,241	606,748	711,475	102,308	90,069	72,131	80,406	112,484	2,412,927
August:	Month	19,444,899	20,840,804	22,339,131	3,147,058	2,711,787	1,989,264	2,561,840	3,556,000	76,590,783
	Daily average	627,255	672,284	720,448	101,518	87,477	64,170	82,640	114,709	2,470,670
September:	Month	18,908,169	22,456,860	21,554,269	3,047,250	2,540,070	1,830,225	2,432,430	3,229,000	75,998,273
	Daily average	630,272	748,562	718,207	101,575	84,669	61,007	81,047	104,300	2,533,275
October:	Month	19,430,992	23,431,071	22,176,853	3,058,460	2,652,484	1,836,221	2,571,822	3,612,000	78,769,903
	Daily average	626,806	755,841	715,376	98,660	85,564	59,233	82,962	116,516	2,540,964
November:	Month	19,907,526	22,078,680	20,791,798	2,977,800	2,476,080	1,801,914	2,388,870	3,348,000	75,770,668
	Daily average	663,584	735,956	693,059	99,260	82,536	60,064	79,629	111,600	2,505,689
December:	Month	21,574,703	22,425,722	22,180,102	2,988,400	2,521,571	1,846,841	2,289,040	3,581,000	79,407,379
	Daily average	695,958	723,410	715,487	96,400	81,341	59,576	73,840	115,516	2,561,528
1929—										
January:	Month	23,385,939	22,417,030	23,412,192	2,861,641	2,453,526	1,807,887	2,076,070	3,379,000	81,793,253
	Daily average	754,385	723,130	755,232	92,311	79,146	58,318	66,970	109,000	2,638,492
	Total 12 months	236,340,308	248,939,561	258,706,238	37,693,194	31,799,538	22,863,390	28,766,779	41,131,000	906,240,008
	Daily average	645,739	680,163	706,848	102,987	86,884	62,468	78,598	112,380	2,476,065